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Health and Safety Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III

July 2005

Idaho Cleanup Project

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Health and Safety Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III

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Idaho Cleanup Project

Idaho Falls, Idaho 83415

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U.S. Department of Energy
Assistant Secretary for Environmental Management
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ABSTRACT

This Health and Safety Plan establishes the procedures and requirements that will be used to eliminate or minimize health and safety risks to personnel performing the Waste Area Group 10 remedial action at the Security Training Facility (STF) -02 Gun Range lead-contaminated soil site at the Idaho National Laboratory, as required by the Occupational Safety and Health Administration standard, "Hazardous Waste Operations and Emergency Response." This Health and Safety Plan contains information about the hazards involved in performing the work as well as the specific actions and equipment that will be used to protect personnel while working at the task site.

This Health and Safety Plan is intended to give safety and health professionals the flexibility to establish and modify site safety and health procedures throughout the entire span of site operations, based on the existing and anticipated hazards.

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
ARDC	Administrative Record and Document Control
BEI	biological exposure index
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	*Code of Federal Regulations*
CPR	cardiopulmonary resuscitation
CWA	controlled work area
DAR	Document Action Request
dBA	decibel A-weighted
dBC	decibel C-weighted
DMCS	Document Management Control System
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DWA	designated work area
GDE	guide
HASP	health and safety plan
HAZMAT	hazardous material
HAZWOPER	hazardous waste operations and emergency response
HEPA	high-efficiency particulate air
HSO	health and safety officer
ICDF	Idaho CERCLA Disposal Facility
IDLH	immediately dangerous to life or health
IH	industrial hygienist

INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
ISMS	Integrated Safety Management System
JSA	job safety analysis
LEL	lower exposure limit
MCP	management control procedure
NIOSH	National Institute of Occupational Safety and Health
NRR	noise reduction rating
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
PDD	program description document
PEL	permissible exposure limit
PLN	plan
POD	plan of the day
PPE	personal protective equipment
PRD	program requirements document
RCRA	Resource Conservation and Recovery Act
STF	Security Training Facility
SWP	safe work permit
TLV	threshold limit value
TRAIN	Training Records and Information Network
TWA	time-weighted average
USC	*United States Code*
UV	ultraviolet
VPP	Voluntary Protection Program
WAG	waste area group
WCC	Warning Communications Center

Health and Safety Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III

1. INTRODUCTION

1.1 Purpose

This Health and Safety Plan (HASP) establishes the procedures and requirements that will be used to eliminate or minimize health and safety hazards to personnel conducting the Waste Area Group (WAG) 10 remedial action for the Security Training Facility (STF) -02 Gun Range lead-contaminated site at the Idaho National Laboratory (INL).

1.2 Scope and Objectives

This HASP addresses all work activities associated with the sampling, removal, disposal, and site-restoration activities at the STF-02 Gun Range contaminated with lead fragments and residues. The objective of this HASP is to meet the regulatory requirements of the Occupational Safety and Health Administration (OSHA) standard, "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120). This HASP governs all work at the project sites that is performed by INL management and operations contractor personnel, subcontractors, and any other personnel who enter the project sites.

This HASP has been reviewed and revised, as deemed appropriate, by the health and safety officer (HSO) in conjunction with other project personnel and management to ensure its effectiveness and suitability. With the exception of the emergency contact list shown in Table 10-4, this HASP will be revised as necessary to address changes in scope and ensure suitability for field use.

1.3 Idaho National Laboratory Site Description

The INL, formerly the National Reactor Testing Station, encompasses 2,305 km^2 (890 mi^2), and it is located approximately 55 km (34 mi) west of Idaho Falls, Idaho (Figure 1-1). The U.S. Department of Energy Idaho Operations Office (DOE-ID) is responsible for the INL. The DOE-ID designates operating authority of the INL to government management and operating contractors.

In 1949, the U.S. Atomic Energy Commission (now the U.S. Department of Energy [DOE]) established the National Reactor Testing Station (now the INL) as a site for building and testing a variety of nuclear facilities. In addition, the INL has been the storage facility for transuranic radionuclides and radioactive low-level waste since 1952. Currently, the INL supports the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear-defense materials production, waste management technology development, energy technology and conservation programs, and DOE long-term stewardship programs.

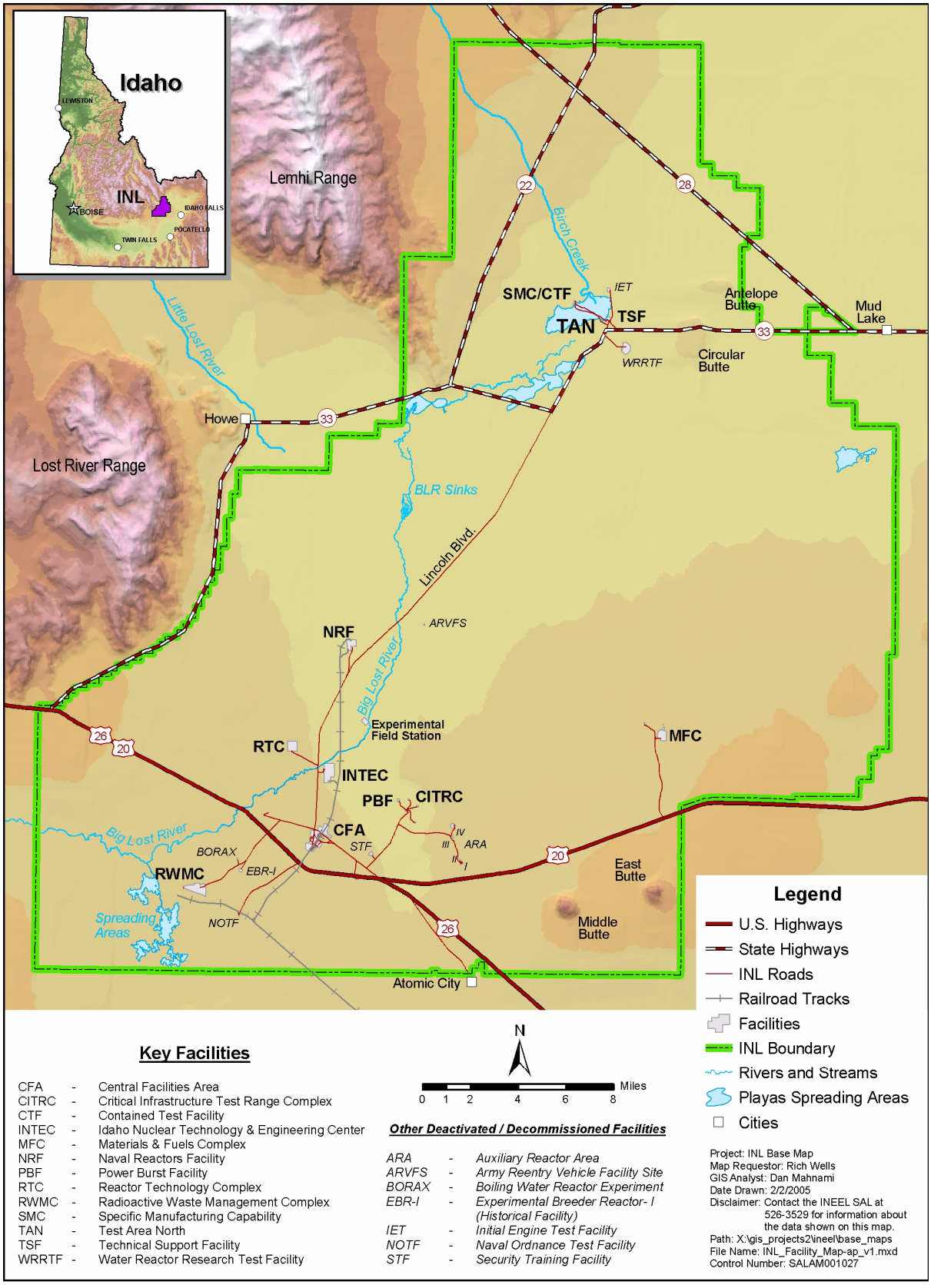

Figure 1-1. Map of the Idaho National Laboratory Site showing the locations of major facilities.

1.4 Background and Project Site Description

The STF area was used from 1983 to 1990 for security-force practice maneuvers, including small arms target practice at a gun range approximately 76 m (250 ft) northeast of the former STF-601 (see Figure 1-2). Approximately 5 million rounds, including tracer rounds, were fired at the range. None of the lead bullets that were fired into, or that ricocheted away from, the range into the "kickout" areas have been picked up. It is estimated that 61 tons of lead and 3.4 tons of copper are present at the site.

The lead contamination associated with the STF-02 Gun Range is from the bullets fired during small-arms target practice. The lead contamination is present as large fragments as well as finely disseminated fragments in the soils. The lead contamination is widely distributed across this site with elevated concentrations detected up to 24,400 mg/kg in one of the berms surrounding the range. Two large areas of concern were identified for assessment after the field sampling: the "kickout" area and the "remainder" area. The remainder area includes the berms, the area between the berms, the area around the Experimental Organic-Cooled Reactor leach pond, the sand area, and the shooting house. The kickout area was eliminated as a concern for both the human health risk assessment and the ecological risk assessment. The maximum concentration of lead detected (24,400 mg/kg) occurred in the 0.15- to 0.45-m (0.5- to 1.5-ft) depth range in the remainder area. These data are presented in Appendix C of the *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04* (DOE-ID 2001).

1.5 Scope of Work

The Phase III activities will address the remediation of lead-contaminated soils found at the STF-02 Gun Range. The gun range berms, the surrounding soil, and the adjacent Experimental Organic-Cooled Reactor leach pond will be excavated to remove soil with lead contamination exceeding the 400-mg/kg remediation goal. The lead and copper fragments from bullets and casings will be separated from the soil, as feasible, to meet Resource Conservation and Recovery Act (RCRA) disposal criteria. Soil not meeting the RCRA disposal criteria will require stabilization before disposal. Soil that exceeds the remediation goal but meets the RCRA disposal criteria will be directly disposed of at the Idaho Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Disposal Facility (ICDF). Soil that meets the remediation goal for lead will be returned to the site.

In addition to the soil, creosote-contaminated railroad ties at the gun range will be removed and sent to an approved, compliant facility for disposal. A wooden building and asphalt pads will be removed and disposed of at either the Central Facilities Area (CFA) landfill or the ICDF as nonhazardous construction debris. After all of the remediation activities are completed, the area will be contoured to match the surrounding terrain and revegetated.

A more detailed description of the site is presented in the "Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase III (Draft Final)"[a] and the "Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III (Draft Final)."[b]

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a. DOE-ID, 2005a, "Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase III (Draft Final)," DOE/NE-ID-11202, U.S. Department of Energy Idaho Operations Office, July 2005.

b. DOE-ID, 2005b, "Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III (Draft Final)," DOE/NE-ID-11212, U.S. Department of Energy Idaho Operations Office, July 2005.

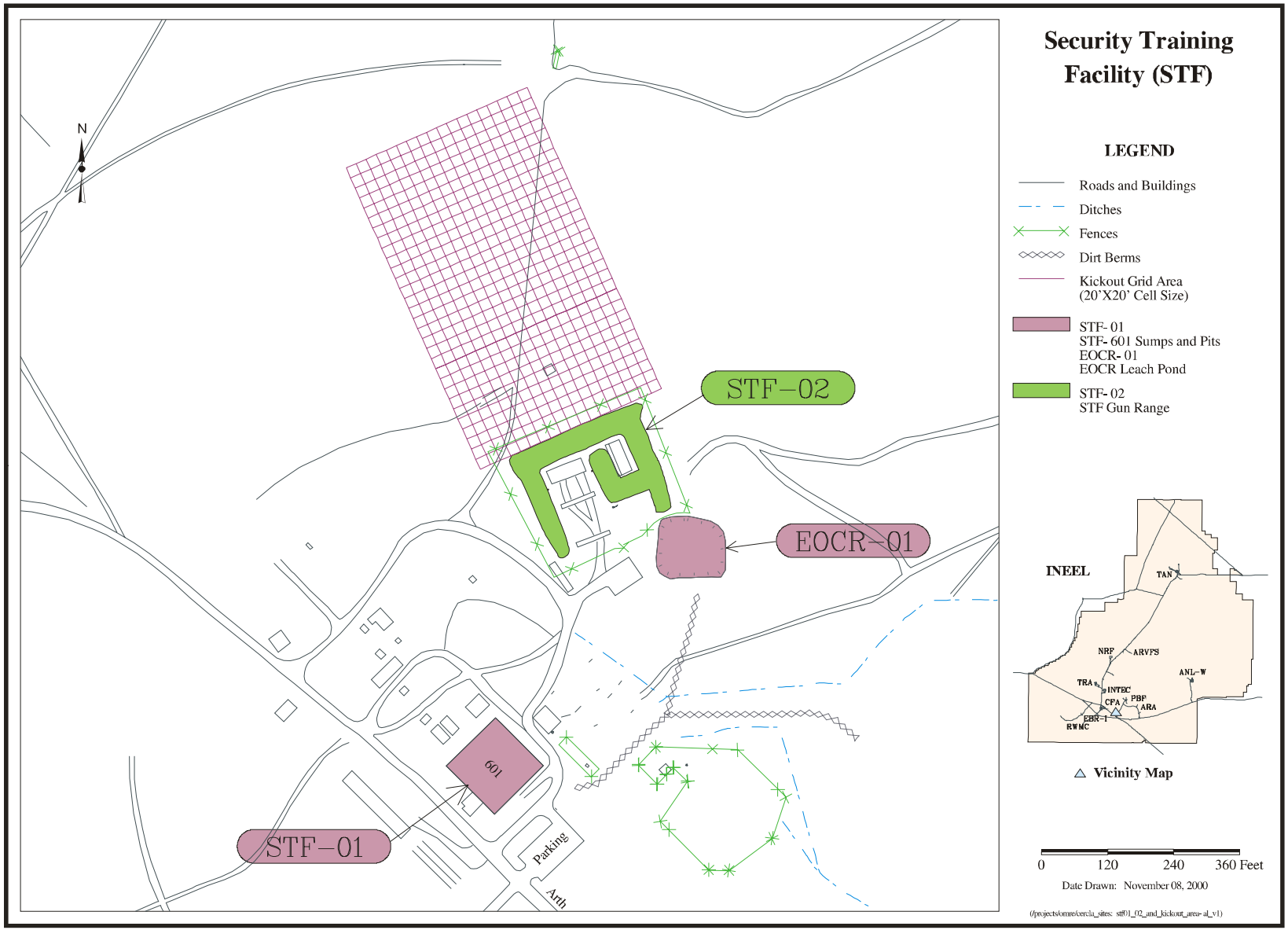


Figure 1-2. The STF-02 Gun Range.

The principal work remedial actions will be as follows:

- Excavate the berms, the surrounding soil, and the adjacent pond with mechanical equipment to remove soil above the remediation goal for lead. Field screening will be used to initially identify the extent of soil excavation required to meet the remediation goal.
- Physically separate copper and lead fragments from the soil. The copper and lead will be recycled off the INL if allowed by DOE policy. If DOE policy prohibits recycling of the recovered metal, it will be stabilized and disposed of in a RCRA-compliant facility on or off the INL.
- After sorting, return soil that contains lead in concentrations below the remediation goal to the site. Stabilize soil that is RCRA characteristic for lead, and send it to the ICDF for permanent disposal. If soil contains lead concentrations above the remediation goal, but is not RCRA characteristic for lead without further treatment, dispose of the soil at the ICDF.
- Encapsulate the railroad ties, and send them to a RCRA-compliant landfill on or off the INL.
- Dispose of the wooden building and asphalt pads as nonhazardous construction debris on the INL in an appropriate landfill, such as the CFA landfill or the ICDF.
- Contour the excavated areas to match the surrounding terrain, and then revegetate them.
- Sample and analyze soil to verify that the remediation goal is achieved. Because all contamination above the remediation goal will be removed, monitoring and sampling after remediation will not be required, and the need for institutional control is not anticipated.

2. HAZARD IDENTIFICATION AND MITIGATION

The purpose of this section is to help the reader to understand the occupational safety and health hazards associated with project tasks. This will enable project management and safety and health professionals to make effective and efficient decisions related to the equipment, processes, procedures, and resource allocation to protect the safety and health of project personnel.

The overall objective of this section is to identify existing and anticipated hazards, based on the project scope of work, and to provide controls to eliminate or mitigate these hazards. The hazard mitigation objective will be accomplished by performing the following tasks:

- Evaluate each project task to determine the physical hazards and chemical and biological exposure potential to project personnel by all routes of entry (radioactive contamination at these WAG 10 sites is not expected).
- Establish the necessary monitoring and sampling required to evaluate the effectiveness of engineering and administrative controls, personal exposures, and contamination levels; determine action levels to mitigate exposures; and provide specific actions to be followed if action levels are reached.
- Determine the necessary engineering controls, isolation methods, administrative controls, work practices, and (where these measures will not adequately control hazards) personal protective equipment (PPE) to further protect project personnel from hazards.

The magnitude of danger presented by these hazards to personnel entering work zones depends on the nature of the tasks being performed and the proximity of personnel to the hazards. Engineering controls will be implemented (whenever possible) along with administrative controls, work control practices, and PPE to further mitigate potential exposures to agents and hazards.

Hazard mitigation described in this section will be used in combination with INL work control processes (e.g., technical procedures, work orders, job safety analyses [JSAs], and Guide [GDE]-6212, "Hazard Mitigation Guide for Integrated Work Control Process") to eliminate or mitigate hazards.

2.1 Chemical Hazards and Mitigation

Lead fragments and lead-contaminated soil present chemical hazards at the contaminated site. However, the potential for exposure to these chemical hazards during project tasks is minimal if the standard operating procedures and technical requirements mentioned above are followed. Table 2-1 lists the contaminants of concern, maximum soil concentrations, and approximate quantity for the STF-02 Gun Range. Other potential chemical hazards might be present from chemicals and fuels in use at the project site.

Table 2-1. Contaminants of concern.[a]

Site	Contaminant of Concern	Exposure Point Concentration (mg/kg)	Contaminated Soil Volume m^3 (yd^3)
STF-02 Gun Range	Lead	24,400 (maximum)	14,900 (19,450)

a. Source: *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites* (DOE-ID 2002)
DOE-ID = U.S. Department of Energy Idaho Operations Office
STF = Security Training Facility

Table 2-2 lists the applicable exposure limits and brief toxicological information for each of the potential chemical hazards of concern. Table 2-2 also lists the chemical, safety and physical, and environmental hazards that might be encountered during project operations, based on known contaminants and operational activities. Table 2-3 summarizes the project tasks, associated hazards, and mitigation methods. Monitoring for specific hazardous agents is covered in Section 3.

Safe work permits (SWPs) and radiological work permits can be used in conjunction with this HASP to address specific hazardous operations (e.g., hot work) and radiological conditions if encountered at specific project sites. If these permits are used, they will provide further detail regarding specialized PPE and dosimeter requirements.

2.2 Safety and Physical Hazards and Mitigation

Industrial safety and physical hazards will present the greatest hazards to workers performing tasks at the project site. Section 4.2 provides general safe-work practices that must be followed. The following subsections describe specific industrial safety hazards related to the remediation activities; these subsections also present procedures to be followed to eliminate or minimize such hazards.

2.2.1 Material Handling and Back Strain

Handling material and maneuvering various pieces of equipment could result in employee injury. All lifting and material-handling tasks will be performed in accordance with Management Control Procedure (MCP) -2692, "Ergonomics Program." Personnel will not physically lift objects weighing more than 50 lb or 1/3 their body weight (whichever is less) alone. In addition, back strain and ergonomic considerations must be given to material handling and equipment use. Whenever possible, mechanical and hydraulic lifting devices should be used to move large or heavy materials. The industrial hygienist (IH) may conduct ergonomic evaluations of various project tasks to determine the potential ergonomic hazards and may provide recommendations to mitigate these hazards. In addition, applicable requirements from Program Requirements Document (PRD) -324, "Material Handling and Storage," will be followed.

2.2.2 Repetitive Motion and Musculoskeletal Disorders

Tasks to be conducted might expose personnel to repetitive-motion hazards, undue physical stress, overexertion, awkward postures, or other ergonomic risk factors that could lead to musculoskeletal disorders. Musculoskeletal disorders can cause a number of conditions, including pain, numbness, tingling, stiff joints, difficulty moving, muscle loss, and paralysis. The assigned project IH will evaluate project tasks and provide recommendations to reduce the potential for musculoskeletal disorders in accordance with the requirements of MCP-2692, "Ergonomics Program."

2.2.3 Working and Walking Surfaces

Slippery or uneven work surfaces can increase the likelihood of back injuries, overexertion injuries, slips, and falls. The ordnance sites are located in the field, and they present inherent tripping hazards such as uneven ground, vegetation, or debris. Tripping and slipping hazards will be evaluated during the course of the project in accordance with PRD-5103, "Walking and Working Surfaces."

2.2.4 Fire and Flammable Material Hazards

Portable fire extinguishers with a minimum rating of 10A/20BC will be located, as needed, at the project site to combat Class ABC fires. In addition, portable fire extinguishers will be located in all vehicles and equipment that have exhaust heat sources and on or near all equipment capable of generating ignition or having the potential to spark.

Table 2-2. Evaluation of chemicals and potential agents that could be encountered.

Material or Chemical (CAS No.)	Exposure Limit[a] (PEL and TLV)	Routes of Exposure	Symptoms of Overexposure (Acute and Chronic)	Target Organs and System	Carcinogen? (Source)	Matrix or Source at Project Site
Lead (7439-92-1)	PEL = 0.05 mg/m^3 TLV = 0.05 mg/m^3	Inhalation, ingestion, and skin or eye contact	Lassitude (weakness, exhaustion), insomnia, facial pallor, anorexia, weight loss, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, paralysis of wrist and ankles, encephalopathy, kidney disease, irritation of eyes, hypotension	Eyes, gastrointestinal track, central nervous system, kidneys, blood, gingival tissue	No	Lead bullets, fragments, and disseminated fragments
Copper (7440-50-8)	PEL = 1 mg/m^3 TLV = 0.5 mg/m^3	Inhalation, ingestion, and skin or eye contact	Irritation of eyes and respiratory system, cough, dyspnea (breathing difficulty), wheezing	Eyes, skin, respiratory system, liver, kidneys (increased risk with Wilson's disease)	Potential occupational carcinogen (NIOSH)	Copper jackets, fragments, and disseminated fragments
Creosote (8001-58-9)	TLV not established	Inhalation, ingestion, and skin or eye contact	Cough, shortness of breath, skin redness and burning sensation, confusion, headache, nausea, vomiting, weakness, shock or collapse	Eyes, skin, respiratory system	Potential carcinogen	Creosote preserved railroad ties

Table 2-2. (continued).

Material or Chemical (CAS No.)	Exposure Limit[a] (PEL and TLV)	Routes of Exposure	Symptoms of Overexposure (Acute and Chronic)	Target Organs and System	Carcinogen? (Source)	Matrix or Source at Project Site
Diesel fuel (68476-34-6) (68334-30-5) (68334-30-2) (68476-31-3) (77650-28-3)	TLV = 100 mg/m^3 (ACGIH—as total hydrocarbons)	Inhalation, ingestion, and skin contact	Eye irritation, respiratory system changes, and dermatitis	Eyes and respiratory system	No	Fuel handling during refueling of diesel-powered equipment
Diesel exhaust particulate	TLV—withdrawn in 2003 *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)* (ACGIH 2003)	Inhalation	Respiratory, nose, throat or lung irritation with stinging and redness of the eyes; headache; nausea; dizziness; and unconsciousness	Respiratory system	No	Exhaust from diesel-powered equipment
Dust—particulate not otherwise regulated	PEL for respirable fraction—5 mg/m^3	Inhalation	Irritation eyes, pneumoconiosis	Respiratory system	No	Dust from excavation activities
Silica	10 mg/m^3 % SiO_2 +2	Inhalation	Cough, dyspnea (breathing difficulty), wheezing; decreased pulmonary function, progressive respiratory symptoms (silicosis); irritation eyes	Respiratory system	Potential occupational carcinogen	Dust from excavation activities

a. Sources: *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)* (ACGIH 2003) and substance-specific standards (29 CFR 1910.1000, "Air Contaminants")

ACGIH = American Conference of Governmental Industrial Hygienists
BEI = biological exposure index
CAS = Chemical Abstract Service
NIOSH = National Institute of Occupational Safety and Health
PEL = permissible exposure limit
TLV = threshold limit value

Table 2-3. Project activities, associated hazards, and mitigation.

Activity or Task	Associated Hazards or Hazardous Agent	Hazard Mitigation
1. Sample and analyze removed soil to determine disposition. 2. Segregate lead and copper fragments from the soil. 3. Perform hand and mechanical excavation. 4. Field-screen soils during excavation. 5. Collect confirmatory soil samples. 6. Backfill excavated areas and revegetate.	1. Chemical contaminants—soil contaminants and chemical usage at site 2. Heavy equipment movement/vehicle traffic—swing radius, pinch points, and struck-by or caught-between hazards 3. Lifting and back strain—material movement and hand excavation 4. Open excavation(s)—contaminated soil site requiring excavation using heavy equipment 5. Tripping hazards/working-walking surfaces—uneven, unstable, or steep terrain; ice and snow-covered surfaces; and rocks and debris 6. Heat and cold stress—outdoor activities 7. Stored energy sources—buried utilities, elevated materials, and moving equipment	1. Hazards will be mitigated through controlled access to sites, material safety data sheets for chemicals in use, protective clothing where contact with materials is anticipated, and monitoring exposures to validate engineering control effectiveness. 2. Hazards will be mitigated through controlled areas, qualified operators, backup signal on equipment and industrial vehicles, body position awareness, communication with the operator, and PPE usage in the controlled work area. 3. Use mechanical excavation equipment where feasible, use a mechanical lifting device where possible, use proper lifting techniques, do not exceed 50-lb (or 1/3 body weight) lift limit, and do not work past fatigue point. 4. Follow all requirements in PRD-22, “Excavation and Surface Penetration”; delineate and post area; and use the barricade or other physical barrier(s) where required to prevent vehicle and equipment from approaching the edge. 5. Clear debris and other tripping hazards from areas where feasible, maintain body position awareness, and wear adequate footwear with nonskid/high-friction soles. 6. Industrial hygiene monitoring and work-rest cycles (as required) will be performed/implemented in accordance with MCP-2704, “Heat and Cold Stress.” 7. Identify and mark all utilities, ensure that all equipment is set in park or in gear with the brake set, and shut off the equipment when not in use.

MCP = management control procedure
PPE = personal protective equipment
PRD = program requirements document

2.2.5 Heavy Equipment and Moving Machinery

Hazards associated with the operation of heavy equipment include injury to personnel (e.g., struck-by and caught-between hazards) and equipment and property damage. All heavy equipment will be operated in the manner in which it was intended and in accordance with the manufacturer's instructions. Only authorized, qualified personnel will be allowed to operate equipment; personnel near operating heavy equipment must maintain visual contact with the operator and stay clear of the swing radius (if excavation equipment is used). Personnel will comply with MCP-2745, "Heavy Industrial Vehicles," and PRD-5123, "Motor Vehicle Safety."

2.2.6 Excavation, Surface Penetrations, and Outages

A combination of hand excavation and heavy equipment will be used during the course of this project. All surface penetrations and related outages will be coordinated through the field supervisor and will require submittal of Form 433.01, "Outage Request." The submission of an outage request will not be considered an approval to start the work.

All excavation and surface penetration activities will be conducted and monitored in accordance with the requirements of PRD-22, "Excavation and Surface Penetration," and 29 *Code of Federal Regulations* (CFR) 1926, Subpart P, "Excavations." Key elements from these requirements include the following:

- Each work day, a competent individual will inspect excavations and protective systems for evidence of situations that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. This inspection will be conducted before the start of work and as needed throughout the shift. Inspections also will be made after any hazard-increasing occurrence. These inspections are required only when employee exposure can be reasonably anticipated.
- Stop logs, barricades, or chocks can be deployed if necessary to prevent vehicles and heavy equipment from falling into open excavations and trenches. If an excavation must be left open and unattended, the area surrounding it must be secured. The area must be clearly posted with caution signs and signs prohibiting unauthorized personnel from entering. Every effort will be made to fill the open excavations as soon as practicable.
- If used, designs of support systems, shield systems, and other protective systems must be selected and constructed in accordance with the requirements set forth in 29 CFR 1926, Subpart P, "Excavations."

2.2.7 Hoisting and Rigging of Equipment

Hoisting and rigging of equipment are not anticipated for the remediation activities. However, if found to be necessary, all hoisting and rigging will be performed in accordance with PRD-600, "Maintenance Management Requirements," and DOE-STD-1090-2004, "Hoisting and Rigging," as applicable. Evidence of a current inspection will be shown on hoisting and rigging equipment (e.g., tag), and qualified personnel will inspect the equipment before use.

2.2.8 Overhead Objects

Overhead objects that personnel might encounter include power poles that will be removed during the remedial action. Personnel will wear required head protection when they are near heavy equipment.

2.2.9 Personal Protective Equipment

Wearing PPE reduces a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. In addition, PPE can increase the risk of heat stress. Work activities at the task site will be modified as necessary to ensure that personnel are able to work safely in the required PPE. Work-site personnel will comply with PRD-5121, "Personal Protective Equipment," and MCP-432, "Radiological Personal Protective Equipment," if radiological hazards are encountered. All personnel who wear PPE will be trained in its use and limitations in accordance with PRD-5121.

2.3 Environmental Hazards and Mitigation

During project tasks, potential environmental hazards will present potential hazards to personnel. These hazards will be identified and mitigated to the extent possible. This subsection describes these environmental hazards and states the procedures and work practices that will be followed to mitigate them.

2.3.1 Noise

Personnel working at the task site might be exposed to noise levels that exceed 85 decibels A-weighted (dBA) for an 8-hour time-weighted average (TWA) and 83 dBA for a 10-hour TWA. The effects of loud noise include the following:

- Personnel being startled, distracted, or fatigued
- Physical ear damage, pain, or temporary or permanent hearing loss
- Interference with communication that would warn of danger.

The IH will measure noise in accordance with MCP-2719, "Controlling and Monitoring Exposure to Noise," to determine if personnel assigned to the tasks identified are above allowable noise exposure levels. A threshold limit value (TLV) of 85 dBA TWA will be applied to personnel exposed to noise levels over no more than an 8-hour day. This level is based on a 16-hour "recovery" period in a low-noise environment. If personnel are required to work longer than 8 hours in a hazardous noise environment, the TLV will be adjusted to 83 dBA for a 10-hour TWA value.

Personnel whose noise exposure meets or exceeds the allowable level will be enrolled in the INL Occupational Medical Program (OMP) or subcontractor Hearing Conservation Program. Personnel working on jobs that have noise exposures greater than 85 dBA (83 dBA for 1-hour TWA) will be required to wear hearing protection. Hearing protection devices will be selected and worn in accordance with MCP-2719, "Controlling and Monitoring Exposure to Noise."

2.3.2 Temperature and Ultraviolet Light Hazards

Project tasks will be conducted during times when the potential exists for heat or cold. The IH and HSO will be responsible for obtaining meteorological information to determine if additional heat or cold stress administrative controls are required. All project personnel must understand the hazards associated with heat and cold stress and take preventive measures to minimize the effects. The guidelines in MCP-2704, "Heat and Cold Stress," will be followed when determining work/rest schedules or when determining whether to halt work activities because of temperature extremes.

2.3.2.1 Heat Stress. High ambient air temperatures can result in increased body temperature, heat fatigue, heat exhaustion, or heat stroke that can lead to symptoms ranging from physical discomfort to death. In addition, tasks requiring the use of protective equipment or respiratory protection prevent the body from cooling. Personnel must inform the HSO or project field team leader when experiencing any signs or symptoms of heat stress or when observing a fellow employee (i.e., buddy) experiencing them. The HSO in conjunction with the IH (as required) will document heat-stress stay times or work/rest regimens on the appropriate work control document(s) (e.g., an SWP, Pre-Job Briefing Form, or other). These stay times will take into account the amount of time spent on a task, the nature of the work (i.e., light, moderate, or heavy), type of PPE worn, and ambient work temperatures. Table 2-4 lists heat stress signs and symptoms.

Table 2-4. Heat stress signs and symptoms.

Heat-Related Illness	Signs and Symptoms	Emergency Care
Heat rash	Red skin rash and reduced sweating	Keep the skin clean, change all clothing daily, and cover affected areas with powder that contains cornstarch or with plain cornstarch.
Heat cramps	Severe muscle cramps and exhaustion, sometimes with dizziness or periods of faintness	Move the patient to a nearby cool place; give the patient half-strength electrolytic fluids; if cramps persist, or if signs that are more serious develop, seek medical attention.
Heat exhaustion	Rapid, shallow breathing; weak pulse; cold, clammy skin; heavy perspiration; total body weakness; and dizziness that sometimes leads to unconsciousness	Move the patient to a nearby cool place, keep the patient at rest, give the patient half-strength electrolytic fluids, treat for shock, and seek medical attention. DO NOT TRY TO ADMINISTER FLUIDS TO AN UNCONSCIOUS PATIENT.
Heat stroke	Deep, then shallow, breathing; rapid, strong pulse, then rapid, weak pulse; dry, hot skin; dilated pupils; loss of consciousness (possible coma); and seizures or muscular twitching	Cool the patient rapidly. Treat for shock. If available, wrap cold packs or ice bags, and place one bag or pack under each armpit, one behind each knee, one in the groin, one on each wrist and ankle, and one on each side of the neck. Seek medical attention as rapidly as possible. Monitor the patient's vital signs constantly. DO NOT ADMINISTER FLUIDS OF ANY KIND.

NOTE: *Heat exhaustion and heat stroke are extremely serious conditions that could result in death and should be treated as such. The field team leader or designee should immediately request that an ambulance (777 or 526-1515) be dispatched from the CFA-1612 medical facility, and the individual should be cooled as described in Table 2-4, based on the nature of the heat stress illness.*

2.3.2.2 Low Temperatures and Cold Stress. Personnel will be exposed to low temperatures during fall and winter months or at other times of the year if relatively cool ambient temperatures combined with wet or windy conditions exist. The guidelines in MCP-2704, "Heat and Cold Stress," will be followed.

Additional cold weather hazards might exist from working on snow- or ice-covered surfaces. Slip, fall, and material-handling hazards are increased under these conditions. Every effort must be made to ensure that walking surfaces are kept clear of ice. The HSO should be notified immediately if slip or fall hazards are identified at the project locations.

2.3.2.3 Ultraviolet Light Exposure. Personnel will be exposed to sunlight when conducting project tasks. Sunlight is the main source of ultraviolet (UV) light known to damage the skin and cause skin cancer. The amount of UV light exposure depends on the strength of the light, the length of exposure, and whether the skin is protected. No UV rays or suntans are safe. The following are mitigative actions that can be taken to minimize UV exposure:

- Wear clothing to cover the skin (long pants [no shorts] and a long-sleeve or short-sleeve shirt [no tank tops])
- Use a sunscreen with a sun protection factor of at least 15
- Wear a hat (hard hat where required)
- Wear UV-absorbing safety glasses
- Limit exposure during peak intensity hours of 10 a.m. to 4 p.m., whenever possible.

2.3.3 Inclement Weather Conditions

When inclement or adverse weather conditions develop that could pose a threat to persons or property at the project site (e.g., sustained winds 25 miles per hour or greater, electrical storms, heavy precipitation, or extreme heat or cold), conditions will be evaluated, and a decision will be made by the HSO with input from other personnel to halt work, use compensatory measures, or proceed. All work will comply with INL MCPs and facility work control documents that specify limits for inclement weather.

2.3.4 Biological Hazards

The INL is located in an area that provides habitat for various rodents, insects, and other vectors (i.e., organisms that carry disease-causing microorganisms from one host to another). The potential exists for encountering nesting materials or other biological hazards and vectors. Hantavirus could be present in the nesting and fecal matter of deer mice. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Contact with and improper removal of these materials could cause additional inhalation exposure risks.

If suspected rodent nesting or excrement material is encountered, the IH will be notified immediately and **no attempt will be made to remove or clean the area**. After the area has been evaluated, such material will be disinfected and removed in accordance with the requirements of MCP-2750, “Preventing Disease from Rodents, Birds, and Bats.”

Snakes, insects, and arachnids (e.g., spiders and ticks) also might be encountered. Common areas to avoid include material stacking and staging areas, under existing structures (e.g., trailers and buildings), under boxes, and other areas that provide shelter. Generally, protective clothing will prevent insects from direct contact with the skin. If potentially dangerous snakes or spiders are found or are suspected of being present, warn others, keep clear, and contact the IH or HSO for additional guidance.

Insect repellant (with DEET or an equivalent active ingredient) might be required. Areas where standing water has accumulated (e.g., evaporation ponds) provide breeding grounds for mosquitoes; thus, these areas should be avoided. In cases where a large area of standing water is encountered, it might be necessary to pump the water out of the area.

2.3.5 Confined Spaces

Excavations are not anticipated to present hazardous atmospheres, and no other confined spaces are anticipated at the project site. The IH will be contacted if there is any question as to whether an excavation could present a hazardous atmosphere or a space meets the definition of a confined space. If entry into a confined space is required, then all requirements of MCP-2749, "Confined Spaces," will be followed.

2.4 Other Task-Site Hazards

Task-site personnel should continually look for potential hazards and immediately inform the job site supervisor or HSO of the hazards so that action can be taken to correct the condition. All personnel have the authority to initiate STOP WORK actions in accordance with MCP-553, "Stop Work Authority," if an imminent safety or health hazard exists.

Personnel working at the task site must use safe work practices, report unsafe working conditions or acts, and exercise good housekeeping habits with respect to tools, equipment, and waste throughout the course of the project.

2.5 Site Inspections

Project personnel may participate in site inspections during the work-control preparation stage (such as the hazard identification and verification walk-downs), and they may conduct self-assessments or other inspections.

During operations, targeted or required self-assessments may be performed in accordance with MCP-8, "Performing Management Assessments and Management Reviews." Health and safety professionals at the task site can recommend changes in work habits at any time. However, all changes that could affect the work control documents must have concurrence from the appropriate project technical representatives, and a data analysis report must be prepared, when required.

3. EXPOSURE MONITORING AND SAMPLING

Monitoring and sampling will be used throughout project operations to (1) assess the effectiveness of engineering controls, (2) determine the appropriate PPE requirements for individual tasks, and (3) determine the need for upgrading and downgrading PPE, as described in Section 5. Monitoring with direct-reading and mobile instruments will be conducted to provide health and safety professionals with real-time and trending data to assess the effectiveness of control measures.

Tables 3-1, 3-2, and 3-3 provided in this section present the strategy for conducting exposure monitoring and sampling.

Industrial Hygiene will conduct environmental and personnel monitoring with direct-reading instrumentation, swipes, and full- and partial-period air sampling in accordance with the applicable MCPs and OSHA substance-specific standards. Instrumentation will be selected based on the site-specific conditions and contaminants associated with project tasks. The IH will be responsible for determining the best monitoring technique for hazardous contaminants. Safety hazards and other physical hazards will be monitored and mitigated, as outlined in Section 2.

The project IH will conduct full- and partial-period sampling of airborne contaminants and monitoring of physical agents, as listed on Table 3-1 and as deemed appropriate. When conducted, all air sampling will be done using applicable National Institute of Occupational Safety and Health (NIOSH), OSHA, or other validated methods. Both personal and area sampling and monitoring can be conducted.

Table 3-1. Tasks and hazards to be monitored, frequency, and monitoring instrument category.

Tasks	Hazard(s) to be Monitored[a]	Instrument Category to be Used
• Sample and analyze removed soil to determine disposition. • Segregate lead and copper fragments from the soil. • Perform hand and mechanical excavation. • Field-screen soils during excavation. • Collect confirmatory soil samples. • Backfill excavated areas and revegetate.	Chemical and nonradiological constituents and hazardous atmospheres	3 and 4
	Respirable dust—silica and other particulates of concern	3 and 5
	Hazardous noise	6
	Ergonomics, repetitive motion, and lifting	7
	Heat and cold stress	8

a. Based on specific tasks and site conditions, monitoring and sampling will be conducted as deemed appropriate by project Industrial Hygiene and Radiological Control personnel.

Table 3-2. Monitoring instrument category and description.

Instrument Category	Instrument Category Number Description[a]
3	Organic vapor: Direct-reading instruments (photoionization detector, flame ionization detector, or infrared detector), detector tubes, or grab samples
	Dust: Direct-reading instrument (optical particle counter or equivalent)
4	Organic vapors and other airborne constituents, particulate, or hazardous atmospheres: Personal sampling pumps with appropriate media for partial- and full-period sampling using NIOSH- or OSHA-validated methods, direct-reading instruments, or remote-sensing detectors
5	Silica dust, respirable: NIOSH 7500 or equivalent, personal sampling pump, 10-mm cyclone, or full-period sampling
6	ANSI Type S2A sound-level meter or ANSI S1.25-1991 dosimeter (A-weighted scale for time-weighed average dosimetry and C-weighted scale for impact-dominant sound environments)
7	Observation and ergonomic assessment of activities will be performed in accordance with MCP-2692, "Ergonomics Program," and *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)* (ACGIH 2003).
8	Heat stress: Wet-bulb globe temperature, body weight, and fluid intake
	Cold stress: Ambient air temperature and wind chill charts

a. Equivalent instrumentation other than those listed can be used.

ACGIH = American Conference of Governmental Industrial Hygienists
ANSI = American National Standards Institute
BEI = biological exposure index
MCP = management control procedure
NIOSH = National Institute for Occupational Safety and Health
OSHA = Occupation Safety and Health Administration
TLV = threshold limit value

Table 3-3. Action levels and associated responses for project operational hazards.

Contaminant or Agent Monitored	Action Level	Response Taken if Action Level is Exceeded
Nonradiological nuisance particulates (insoluble or poorly soluble—not otherwise specified)	>10 mg/m^3 (inhalable fraction) >3 mg/m^3 (respirable fraction)	Substitute equipment or change the method to reduce emissions at the source. Verify engineering control operation (where in place) or institute engineering controls (such as closed cabs for equipment operators). Evaluate air movement (wind) conditions and reschedule tasks or reposition personnel to upwind position of source. Move operation to alternate location (with engineering controls, if possible). Use wetting or misting methods to minimize dust and particulate matter. IF wetting or misting methods prove ineffective, THEN don respiratory protection[a] (as directed by the IH).
Nonradiological airborne contaminant (chemical, dust, fume, fiber, or particulate)	Based on individual contaminant exposure limit (ACGIH TLV [ACGIH 2003] or OSHA PEL) and 29 CFR 1910 substance-specific requirements. Generally, sustained levels at the TLV or PEL in the worker's breathing zone for 2 minutes should be used as the action limit. Use these values where short-term exposure limits, ceiling values, or OSHA substance-specific action limits exist.	Substitute equipment or change the method to reduce emissions at the source. Verify engineering control operation (where in place) or institute engineering controls (such as closed cabs for equipment operators). Evaluate air movement (wind) and reschedule tasks or reposition personnel to upwind position of source. Move operation to alternate location (with engineering controls, if possible). IF engineering and administrative controls do not control contaminant below exposure limit, THEN reevaluate engineering and administrative controls or don respiratory protection[a] (as directed by the IH). IF the OSHA substance-specific standard action limit is exceeded, THEN initiate applicable medical surveillance requirements.

Table 3-3. (continued).

Contaminant or Agent Monitored	Action Level		Response Taken if Action Level is Exceeded	
Nonradiological hazardous atmosphere Chemical IDLH, oxygen deficient, oxygen enriched, 10% of chemical LEL	As defined by MCP-2749, confined spaces are based on criteria such as oxygen level, individual contaminant IDLH value, and LEL. **NOTE:** *No entry into an area or space containing a hazardous atmosphere is permitted without the authorization of the project operations manager, or representative, in conjunction with health and safety professionals. This authorization will be demonstrated through the use of approved operational procedures or other work control documents in conjunction with a confined space entry permit.*		Eliminate hazardous atmosphere through the use of engineering controls or natural ventilation. Reschedule operations when the area or space will not have a hazardous atmosphere. Evaluate space or area to be entered. IF the operation can be conducted outside the area or space, THEN perform operation without entry. Measure the atmosphere before initiating operation or personnel entry, and verify that acceptable entry conditions have been met (e.g., oxygen and LEL), and use engineering controls to maintain a safe atmosphere and below the specified exposure limit. Use the permit system to authorize entry. IF engineering control fails to control contaminant below the safe atmospheric and exposure limit, THEN stop the operation and evacuate personnel until a safe atmosphere and specified entry conditions can be achieved. IF an IDLH atmosphere must be entered, THEN don appropriate air-supplied respiratory protection (with escape capacity) and protective clothing.[a] At least one stand-by person dressed in proper PPE must be present for each entrant. **NOTE:** *The INL Fire Department also must be notified for any area or space entry into an IDLH atmosphere to ensure that adequate rescue equipment and resources are in place.*	
Hazardous noise levels	<85 dBA 8-hour TWA or equivalent TWA for 10- or 12-hour exposure		No action	
	85 to 114 dBA or equivalent TWA for 10- or 12-hour exposure		Substitute equipment with a quieter type. Isolate noise source or place sound-absorbing barrier in noise path. Hearing protection is required to attenuate hazard to below an 85 dBA 8-hour TWA or equivalent TWA for 10- or 12-hour exposure (device NRR).	
	(a) >115 dBA	(b) >140 dBC	(a) Isolate source; evaluate NRR for single device, double protection as needed.	(b) Control entry around source and isolate source. No exposure to continuous, intermittent, or impact noise in excess of a peak 140-dBC level.

Table 3-3. (continued).

Contaminant or Agent Monitored	Action Level	Response Taken if Action Level is Exceeded
Other facility or INL alarms	Facility or INL alarm	See Section 10.6, "Personnel Roles, Lines of Authority, and Training," for emergency response action following facility or INL alarms.

a. Respiratory protection and clothing as prescribed by the project Industrial Hygiene and Radiological Control personnel (based on contaminant of concern). See Section 5, "Personal Protective Equipment," for additional PPE requirements.

ACGIH = American Conference of Governmental Industrial Hygienists
CFR = *Code of Federal Regulations*
dBA = decibel A-weighted
dBC = decibel C-weighted
IDLH = immediately dangerous to life or health
IH = industrial hygienist
INL = Idaho National Laboratory
LEL = lower exposure limit
MCP = management control procedure
NRR = noise reduction rating
OSHA = Occupational Safety and Health Administration
PEL = permissible exposure limit
PPE = personal protective equipment
TLV = threshold limit value
TWA = time-weighted average

Various direct-reading instruments can be used to determine the presence of nonradiological and other physical agents. The frequency and type of sampling and monitoring will be determined by changing site conditions, direct-reading instrument results, observation, and professional judgment and in accordance with the MCP-153, "Industrial Hygiene Exposure Assessment."

All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's recommendations, existing Industrial Hygiene protocol, and *Manual 14A–Safety and Health–Occupational Safety and Fire Protection* (Safety and Fire Protection Department 2005a) and *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene* (Safety and Fire Protection Department 2005b). Direct-reading instruments will be calibrated, at a minimum, before daily use and more frequently as determined by the project IH. Calibration information, sampling and monitoring data, results from direct-reading instruments, and field observations will be recorded as stated in Section 12, "Recordkeeping Requirements."

4. ACCIDENT AND EXPOSURE PREVENTION

Project activities will present numerous safety hazards to personnel conducting these tasks. It is critical that all personnel understand and follow the site-specific requirements of this HASP and adhere to the standard operating procedures and technical requirements mentioned in Section 1.5, "Scope of Work." Engineering controls, hazard isolation, specialized work practices, and the use of PPE will be implemented to eliminate or mitigate all potential hazards and exposures, where feasible. However, all personnel are responsible for identifying and controlling hazards in their work area in accordance with Integrated Safety Management System (ISMS) principles and practices (PDD-1004). **At no time will hazards be left unmitigated without implementing some manner of controls (e.g., engineering controls, administrative controls, or the use of PPE).** Project personnel should use stop work authority in accordance with MCP-553, "Stop Work Authority," where it is perceived that imminent danger to personnel, equipment, or the environment exists.

This HASP should be used in conjunction with PRD-25, "Activity Level Hazard Identification, Analysis, and Control," and work authorization and control documents (such as STD-101, "Integrated Work Control Process"; work orders; JSAs; MCP-3562, "Hazard Identification, Analysis, and Control of Operational Activities"; and operational technical procedures). Where appropriate, MCP-3562, GDE-6212, mitigation guidance, and JSAs will be used.

4.1 Voluntary Protection Program and Integrated Safety Management System

The INL safety processes embrace the Voluntary Protection Program (VPP) (PRD-5119) and ISMS criteria, principles, and concepts to identify and mitigate hazards, thereby preventing accidents. All management and workers are responsible for implementing safety policies and programs and for maintaining a safe and healthful work environment. Project personnel are expected to take a proactive role in preventing accidents, ensuring safe working conditions for themselves and fellow personnel, and complying with all work control documents, procedures, and permits.

The **ISMS** is focused on the **system** side of conducting operations, and **VPP** concentrates on the **people** aspect of conducting work. Both programs define work scope, identify and analyze hazards, and mitigate the hazards; additional information on these programs is available on the INL Intranet. CH2M-WG Idaho, LLC, the current primary management and operating contractor, and its subcontractors participate in VPP and ISMS for the safety of their employees. This document includes all elements of both systems. The six key elements of VPP and ISMS and their corresponding HASP sections are shown in Table 4-1.

Table 4-1. The six key elements of the Voluntary Protection Program and the Integrated Safety Management System and their corresponding Health and Safety Plan section.

Voluntary Protection Program	Integrated Safety Management System	Health and Safety Plan Section
—	Define work scope	Section 1
Work site analysis	Analyze hazards	Sections 2, 3, 5, and 8
Hazard prevention and control	Develop and implement controls	Sections 2, 3, 4, 5, 7, 10, and 11
Safety and health training	Perform within work controls	Sections 6
Employee involvement	Perform work within controls	Sections 2, 3, and 4
Management leadership	Provide feedback and improvement	Sections 6 and 9

4.2 General Safe-Work Practices

Sections 1 and 2 defined the project scope of work and associated project-specific hazards and mitigation. The following practices are mandatory for all project personnel to further reduce the likelihood of accidents and injuries. All visitors permitted to enter work areas must follow these requirements. Failure to follow these practices could result in permanent removal from the project and in other disciplinary actions.

- Work area access will be limited to authorized personnel only.
- All personnel have the authority to initiate STOP WORK actions in accordance with MCP-553, "Stop Work Authority."
- Personnel will not eat, drink, chew gum or tobacco, smoke, apply sunscreen, or do anything else that increases the probability of hand-to-mouth transfer and ingestion of materials in project work areas. Designated eating and drinking areas will be established.
- Be aware of and comply with all safety signs, tags, barriers, and color codes in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes."
- Be alert for dangerous situations, strong or irritating odors, airborne dusts or vapors, and spills that might be present. Report all potentially dangerous situations to the job site supervisor or HSO.
- Avoid direct contact with hazardous materials. Do not walk through spills or other areas of known ordnance explosive contamination, and avoid kneeling, leaning, or sitting on equipment or surfaces that might be contaminated.
- Be familiar with the physical characteristics of the project site, including, but not limited to, the following:
    - Prevailing wind direction
    - Location of fellow personnel, equipment, and vehicles
    - Communications at the project site and with the nearest facility
    - Major roads and means of access to and from the project site
    - Location of emergency equipment
    - Warning devices and alarms for the area or facility
    - Capabilities and location of nearest emergency assistance.
- Report all broken skin or open wounds to the HSO. An OMP physician must examine all wounds to determine the nature and extent of the injury.
- Ground-fault protection will be provided whenever temporary wiring (i.e., an extension cord) is used. Cords must be rated in accordance with PRD-5099, "Electrical Safety."
- Keep all ignition sources at least 15 m (50 ft) from explosive or flammable environments.
- Follow all safety and radiological precautions and limitations set forth in technical procedures and requirements identified in work packages.

4.3 Subcontractor Responsibilities

Subcontractors are responsible for meeting all applicable INL MCP, PRD, VPP, and ISMS flow-down requirements such as those listed on the completed INL Form 540.10, "Subcontractor Requirements (SRM) Manual Applicability"; *Subcontractor Requirements Manual* (Project and Construction Management Department 2005); and contract general and special conditions. In addition, subcontractors are expected to take a proactive role in hazard identification and mitigation while conducting project tasks; subcontractors must report unmitigated hazards to the appropriate project point of contact after taking actions to mitigate the situation within the documented work controls.

4.4 Buddy System

The two-person system, or buddy system, will be used during project tasks. The buddy system requires each employee to assess and monitor his or her buddy's mental and physical well-being during the course of the operation. A buddy must be able to perform the following activities:

- Provide assistance if required
- Verify the integrity of PPE
- Observe his or her buddy for signs and symptoms of heat stress, cold stress, or contaminant exposure
- Notify other personnel in the area if emergency assistance is needed
- Perform additional responsibilities as assigned by the job site supervisor.

5. PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to shield or isolate personnel from hazardous, physical, and biological hazards that cannot be eliminated though engineering or other controls. It is important to realize that no single PPE ensemble can protect against all hazards under all conditions, and proper work practices and adequate training will augment PPE to provide the greatest level of protection to workers.

This section provides guidance for selecting and using PPE to be worn for project tasks and contingencies for upgrading and downgrading PPE. Generally, types of PPE are divided into two broad categories: (1) respiratory protection equipment and (2) personal protective clothing. Both of these categories are incorporated into the standard four levels of protection (Levels A, B, C, and D).

The type of PPE will be selected, issued, used, and maintained in accordance with PRD-5121, "Personal Protective Equipment." Selection of the proper PPE is based on the following considerations:

- Specific conditions and nature of the tasks
- Potential contaminant routes of entry
- Physical form and chemical characteristics of hazardous materials
- Toxicity of hazardous materials that might be encountered
- Duration and intensity of exposure (acute or chronic)
- Compatibility of chemical(s) with PPE materials and potential for degradation or breakthrough
- Environmental conditions (e.g., humidity, heat, cold, and rain)
- The hazards identified in this HASP (Section 2).

Modified Level D equipment is all that is required when performing site remediation activities, based on the criteria listed above. Though not anticipated, a full- or half-face respirator fitted with a particulate filter or chemical cartridge (Level C) also might be worn, as determined by the IH or HSO, based on monitoring results.

5.1 Personal Protective Equipment Levels

The following subsections provide general guidance on typical hazardous waste operations and emergency response (HAZWOPER) levels of PPE. Project operational activities will be evaluated to determine the most appropriate type of PPE, which may or may not incorporate traditional HAZWOPER levels. Additional PPE requirements might be specified in the SWP (where required) and JSAs.

Table 5-1 lists PPE items typically included for the two traditional HAZWOPER levels of PPE. Assigned project safety and health professionals will determine these PPE-level ensemble requirements based on the hazards present, monitoring results, and nature of the operational task. Modifications of PPE levels will be made based on changing operational conditions and monitoring results. Such modifications are routinely employed to maximize efficiency and meet operational-specific needs without compromising personnel safety and health.

Table 5-1. Levels and options of personal protective equipment.

Personal Protective Equipment Level	Personal Protective Equipment Required[a]	Optional Personal Protective Equipment or Modifications
D	Coveralls or standard work clothes (coverall material type based on Industrial Hygiene determination) Hardhat (unless working indoors with no overhead or falling debris hazards) meeting ANSI Z89.1 requirements Eye protection (safety glasses meeting ANSI Z87.1 requirements as a minimum) Hand protection (material based on type of work and hazardous materials being handled) Safety footwear (steel or protective toe and shank) meeting ANSI Z41 requirements or sturdy leather footwear above the ankle for construction tasks	Chemical protective clothing specified by IH Chemical-resistant hand and foot protection (e.g., inner and outer gloves and boot liners) Any specialized protective equipment (e.g., hearing protection, gloves, face shields, welding goggles, and aprons)
C	Level D ensemble with the following respiratory and whole-body protection upgrades:[b] • Half or full face piece air-purifying respirator equipped with a NIOSH-approved HEPA filter or chemical and HEPA combination cartridge (IH to specify cartridge type) • Standard Tyvek (or equivalent) coverall OR • Chemical-resistant coveralls (e.g., Tyvek or coated Tyvek; IH to specify material)	Chemical-resistant outer shoe or boot cover (IH to specify material) Inner chemical-resistant gloves with cotton liners (as determined by the IH) Outer chemical-resistant gloves (as determined by the IH) Any specialized protective equipment (e.g., hearing protection, welding lens, and aprons) (Safety glasses are not required if wearing a full-face respirator.)

a. The IH may modify the PPE ensemble to provide protection for the skin or from other physical hazards.
b. The IH in conjunction with other environment, safety, and health professionals will determine the upgrades.

ANSI = American National Standards Institute
HEPA = high-efficiency particulate air
IH = industrial hygienist
NIOSH = National Institute of Occupational Safety and Health
PPE = personal protective equipment

5.1.1 Level D Personal Protective Equipment

Level D PPE will only be selected for protective clothing and not for project tasks with respiratory or skin absorption hazards requiring whole-body protection. Level D PPE provides no protection against airborne chemical hazards; however, Level D PPE is used for protection against surface contamination

and physical hazards. Level D PPE will be the primary PPE level for the task site, unless additional hazards are encountered or monitoring indicates exposure levels exceeding the action limits.

Level D PPE is appropriate for use during all site remediation activities when personnel are not likely to be exposed to airborne explosive materials at concentrations above the TLV or permissible exposure limit (PEL) (see Table 2-2 for a list of the TLVs and PELs for potential chemical hazards).

The Level D PPE required for tasks under this HASP include the following:

- Coveralls or street clothes
- Hard hat
- Safety glasses with side shields
- Sturdy leather boots with steel- or composite-reinforced toe
- Leather gloves when handling ordnance or shrapnel
- Hearing protection as directed by the IH.

Level C PPE upgrades that may be implemented by the IH or HSO include the following:

- Nitrile gloves when handling potentially hazardous materials
- Respiratory protection.

All personnel required to wear respirators will complete training and be fit-tested before being assigned a respirator in accordance with the training and documentation requirements in Section 6, "Personnel Training." Requirements for respirator use, emergency use, storage, cleaning, and maintenance—as stated in MCP-2726, "Respiratory Protection"—will be followed.

The project HSO, in consultation with the project IH, will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE based on changing site conditions or activities is a normal occurrence.

NOTE: *Personnel must inspect all PPE before donning it. Items found to be defective or that become unserviceable during use will be doffed and disposed of in accordance with posted procedures and will be placed in the appropriate waste stream (as applicable).*

5.1.2 Level C Personal Protective Equipment

Level C PPE will be worn when the task site (chemical) contaminants have been well-characterized, thereby indicating that (1) personnel are protected from airborne exposures by wearing an air-purifying respirator with the appropriate cartridges, (2) no oxygen-deficient environments exist (less than 19.5% at sea level), and (3) no conditions exist that are immediately dangerous to life or health.

5.2 Upgrading and Downgrading Personal Protective Clothing

The assigned IH (subcontractor HSO) will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE based on changing operational conditions (e.g., equipment, waste types, and location of tasks) is a normal occurrence. If changing conditions are encountered, work control documents (e.g., the work order and JSA) might require

updating to reflect these changes or might require augmentation by an SWP. Additional reasons for upgrading or downgrading PPE are listed in Sections 5.2.1 and 5.2.2 below.

5.2.1 Upgrading Criteria for Personal Protective Equipment

The level of PPE required will be upgraded for the following reasons, and work will halt until PPE has been upgraded:

- Identification of new, unstable, or unpredictable hazards or exposures
- Temporary loss or failure of any engineering controls
- Presence of contaminants that present difficulty in monitoring or detecting
- Known or suspected presence of skin absorption hazards
- Anticipation of newly identified source or possible increasing concentration of respiratory hazard(s)
- Change in operational activity that could result in increased contact with contaminants or trigger any of the criteria listed above.

5.2.2 Downgrading Criteria for Personal Protective Equipment

The level of PPE will be downgraded under the following conditions:

- Elimination of hazard or completion of operational task(s) requiring specific PPE
- Implementation of new engineering or administrative controls that eliminate or significantly mitigate the hazard
- Sampling information or monitoring data that show contaminant levels to be stable and lower than initial or estimated levels
- Elimination of potential skin absorption or contact hazards.

5.3 Inspection of Personal Protective Equipment

All PPE ensemble components must be inspected before use and when in use during project activities in accordance with PRD-5121, “Personal Protective Equipment.” Once PPE is donned, inspection by the individual wearing it will be the principal form of inspection. If PPE becomes damaged or degradation or permeation is suspected, the individual wearing the PPE will inform others of the problem and proceed directly to the work area’s exit point. After the required surveys, the PPE will be doffed and replaced. In addition, all PPE that becomes grossly contaminated or that presents a potential source for the spread of such contamination will be required to be decontaminated or replaced.

Table 5-2 provides a general inspection checklist for common PPE items. Not all PPE ensemble items listed may be required for project tasks. When specialized protective clothing or respiratory protection is used or required, the manufacturer’s inspection requirements in conjunction with regulatory or industry inspection practices will be followed. The assigned project IH or safety professional should be consulted about specific PPE inspection criteria.

Table 5-2. Inspection checklist for personal protective equipment.

Personal Protective Equipment Item	Inspection
Level D and C clothing	Before use: • Visually inspect for imperfect seams, nonuniform coatings, and tears • Hold PPE up to the light and inspect for pinholes, deterioration, stiffness, and cracks. While wearing in the work zone: • Inspect for evidence of chemical attack (e.g., discoloration, swelling, softening, and material degradation) • Inspect for tears, punctures, and zipper or seam damage • Check all taped areas to ensure that they are still intact.
Gloves	Before use: • Pressurize rubber gloves to check for pinholes by blowing in the glove then closing off and rolling up the glove until air is trapped; then inspect. No air should escape. Leather gloves: • Inspect seams and glove surface for tears and splitting, and verify that no permeation has taken place.
Respirators (half or full face piece air-purifying)	Before use: • Verify that the respirator has not exceeded its shelf life • Check the condition of the face piece, head straps, valves, connecting lines, and fittings, and ensure that all connections are tight • Check the cartridge to ensure that the proper type or combination is being used for atmospheric hazards to be encountered, and inspect threads and O-rings for pliability, deterioration, and distortion.

PPE = personal protective equipment

6. PERSONNEL TRAINING

All INL personnel will receive training, as specified in 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," and INL manuals. Table 6-1 summarizes the project-specific training requirements. Based on changing field conditions, modifications (e.g., additions or deletions) of the training requirements listed in Table 6-1 might be necessary. The HSO—with concurrence from the job site supervisor, project manager, and IH (as applicable)—will approve any changes to the requirements listed in Table 6-1. These changes should be based on site-specific conditions; generally, the changes will be considered minor changes to the HASP, as defined by instructions from Form 412.11, "Document Management Control Systems (DMCS) Document Action Request (DAR)," because they are administrative in nature.

6.1 General Training

All project personnel are responsible for meeting training requirements, including applicable refresher training. Evidence of training will be maintained at the project site, field administrative location, or electronically (e.g., Training Records and Information Network [TRAIN] [INEEL 2001]). Before being allowed into a project area, nonfield team personnel and visitors must be able to provide evidence of meeting required training for the area of the site they wish to access. As a minimum, all personnel who access project locations must receive a HAZWOPER site-specific briefing, wear PPE, and provide objective evidence of having completed INL computer-based PPE training (00TRN288, "Personal Protective Equipment") or equivalent in accordance with 29 CFR 1910.132, "General Requirements."

A trained HAZWOPER 8-hour supervisor will monitor the performance of each newly trained, 24-hour or 40-hour trained worker to meet the 1 or 3 days of supervised field experience, respectively, in accordance with 29 CFR 1910.120(e). After the supervised field experience period, the supervisor will complete Form 361.47, "Hazardous Waste Operations (HazWoper) Supervised Field Experience Verification," or equivalent, to document the supervised field experience.

NOTE 1: *Supervised field experience is only required if personnel have not previously completed this training at another CERCLA site (documented) or if they are upgrading from 24- to 40-hour HAZWOPER training. A copy of the training record must be available electronically in TRAIN or at the project site as evidence of training.*

NOTE 2: *Completed supervised field experience training forms (Form 361.47 or equivalent) should be submitted to the project training coordinator for inclusion in TRAIN.*

6.2 Project-Specific Training

Before beginning work at the project site, field team members will receive project-specific HASP training that will be conducted by the HSO (or designee). This training will consist of a complete review of (1) a controlled copy of the project HASP, attachments, and DARs; (2) applicable JSA and SWP; (3) work orders; and (4) other applicable work control and work authorization documents, with time for discussion and questions. Project-specific training can be conducted in conjunction with, or separately from, the required formal prejob briefing (MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback").

Table 6-1. Required project-specific training.

Required Training	Job Site Supervisor	HSO	Other Field Team Members	Access into the Designated or Controlled Work Area
HAZWOPER Site Orientation[a]				Yes
40-hour HAZWOPER[b] Operations	Yes	Yes	[c]	[c]
24-hour HAZWOPER[a] Operations			[c]	[c]
8-hour HAZWOPER Supervisor	Yes	Yes		
Project-specific Health and Safety Plan Training[d]	Yes	Yes	Yes	Yes
Lead Awareness	Yes	Yes	Yes	Yes
Fire Extinguisher Training (or equivalent)	Yes	Yes	[e]	
CPR, Medic First Aid	Yes	Yes	[e]	
PPE Use Training	Yes	Yes	Yes	Yes
Hearing Conservation	Yes	Yes	[f]	[f]
HAZMAT Employee General Awareness Training	[g]	[g]	[g]	
Respirator Training (contingency only)	[h]	[h]	[i]	[i]

NOTE: *Shaded fields indicate specific training is not required or applicable.*

a. Includes project-specific hazard communications (29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response"), site access and security, and decontamination and emergency response actions, as required by 29 CFR 1910.120(e).
b. Includes 8-hour HAZWOPER refresher training (as applicable) and supervised field experience as follows: 40-hour HAZWOPER = 24-hour supervised field experience and 24-hour HAZWOPER = 8-hour supervised field experience.
c. The HSO will determine the 40- or 24-hour HAZWOPER training requirement, based on the nature of the project tasks and potential for exposure to contaminants or safety hazards.
d. Training will include all required 29 CFR 1910.120(e) elements and an unexploded ordnance safety briefing.
e. The job site supervisor and HSO will determine the appropriate number of personnel requiring training.
f. As required, in accordance with MCP-2719, "Controlling and Monitoring Exposure to Noise." Consult with the IH.
g. It is only required for individuals identified as a HAZMAT employee, i.e., anyone who directly affects hazardous material transportation safety by handling, packaging, labeling, loading, unloading, moving, or driving (in accordance with the requirements of 49 CFR 171.8, "Definitions and Abbreviations").
h. It is only required if entering an area requiring respiratory protection.
i. Nonfield workers will not be allowed into areas requiring respiratory protection.

CFR = *Code of Federal Regulations*
CPR = cardiopulmonary resuscitation
HAZMAT = hazardous material
HAZWOPER = hazardous waste operations and emergency response
HSO = health and safety officer
IH = industrial hygienist
MCP = management control procedure
PPE = personal protective equipment

At the time of project-specific HASP training, personnel training records will be checked and verified to be current and complete for all the training requirements shown in Table 6-1 (if not already verified). After the HSO (or designee) has completed the site-specific training, personnel will sign Form 361.25, "Group Read and Sign Training Roster," or equivalent, indicating that they have received this training; understand the project tasks, associated hazards, and mitigations; and agree to follow all HASP and other applicable work control and safety requirements. Form 361.25 (or equivalent) training forms are available on the INL Intranet under "Forms."

6.3 Plan-of-the-Day Briefing, Feedback, and Lessons Learned

The job site supervisor or designee will conduct a daily plan-of-the-day (POD) meeting (or equivalent). During this meeting, daily tasks will be outlined; hazards will be identified; hazard controls, mitigation, and work zones will be established; PPE requirements will be discussed; and feedback from personnel will be solicited. At the completion of this meeting, any new work control documents (e.g., SWP or JSA) will be reviewed and signed.

NOTE: *If a formal MCP-3003 prejob briefing is conducted during the work shift, then a POD is not required.*

Particular emphasis will be placed on lessons learned from the previous workday's activities and how tasks can be completed in the safest, most efficient manner. All personnel are encouraged to contribute ideas to enhance worker safety and mitigate potential exposures at the project sites. This POD will be conducted as an informal meeting, and no documentation beyond noting the POD in the field team leader logbook or sampling logbook is required.

Safety and health topic-specific training or safety meetings also can be conducted during the course of the project to reinforce key safety topics. They can be conducted by project safety personnel and the IH or any field team member and should be done in conjunction with the POD. Credit for a safety meeting can be received for such topic-specific training if a tailgate training form (Form 361.24, "Tailgate Attendance Roster," or equivalent) is completed and submitted to the appropriate training coordinator for entry into TRAIN.

7. SITE CONTROL AND SECURITY

Site control and security will be maintained at the project locations during all activities to prevent unauthorized personnel from entering the work area. Entry into and exit from these areas will be controlled through the appropriate use of barriers, signs, and other measures in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes."

The job site supervisor and HSO should be consulted regarding equipment layout at the project site to minimize hazards to personnel from equipment. The equipment layout at the project site should reflect the nature of the hazard presented and should be mitigated through the use of engineering controls (barriers, guards, and isolation), administrative controls (roped-off restricted areas or controlled access), and qualifications of operators and those assisting in the operation of the equipment, when required.

Good housekeeping will be maintained at all times during the course of the project. This includes maintaining working and walking surfaces to minimize tripping hazards, stacking or storing materials and equipment in a central location when not in use, and regularly cleaning up debris and trash at the project site.

Based on the nature of the project tasks to be completed, a graded approach with two types of site control designations (work areas) will be used to meet HAZWOPER site control requirements. These work areas are based on the potential hazards, complexity of work tasks, duration of project tasks, and location and number of nonproject personnel near the project area. The two types of work areas are as follows:

- Designated work areas (DWAs) (established for low-hazard routine tasks)
- Controlled work areas (CWAs) (established for higher-hazard tasks).

The primary differences between the work areas will be the size of the area, method of delineation, and postings, as determined by the activity being conducted and associated hazards. The job site supervisor in conjunction with the HSO will determine the type of work area to be established.

Personnel not directly involved with project activities will be excluded from entering these work areas. Visitors can be admitted into work areas provided that the visitors (1) are on official business, (2) have received site-specific training or orientation (Table 6-1) by the job site supervisor or designee, and (3) have met all of the site-specific training requirements for the area they have a demonstrated need to access.

NOTE: *During certain tasks, visitors might not be allowed into the controlled work areas to minimize risks to workers and visitors. The job site supervisor in consultation with the HSO will make the final determination as to whether a visitor will be allowed to enter a controlled work area.*

All potential hazards will be evaluated when delineating each work area location and size. Barriers (e.g., rope, cones, and printed ribbon) can be used for delineation and demarcation. Where warranted, designated traffic routes also can be established. In addition, these areas will be posted to prevent inadvertent entry by unauthorized personnel.

7.1 Designated Work Area

The established DWAs will consist of the area immediately around the work area, including all equipment. Typically, the DWA's boundary will be marked with cones or stanchions. Generally, the DWA's boundary will not be delineated with rope or ribbon or include other demarcation. All personnel who enter the DWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 5, "Personal Protective Equipment." All DWAs will be delineated and posted with the appropriate signage based on the hazard being controlled in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes." Visitors who do not have appropriate training or PPE to access the DWA, or as determined by the job site supervisor, will be restricted from entering.

7.2 Controlled Work Area

The CWAs will be large enough to encompass the equipment and nature of the tasks being conducted to prevent personnel not assigned to the project task and visitors from being exposed to potential safety and health hazards associated with the project tasks. This type of work area will be established where a more restrictive area is required based on increased hazards. The boundary of the CWA can be marked with a combination of stanchions or posts and delineated with rope or ribbon, and the boundary may include warning signs or other demarcation. Only the minimum number of personnel required to safely perform the project tasks will be allowed into the CWA. The CWA will be a controlled area during all project tasks, and an entry and exit point will be established at the CWA's periphery to regulate the flow of personnel and equipment. All personnel who enter the CWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 5, "Personal Protective Equipment."

7.3 Site Security

Established controlled work areas will be delineated with rope and adequate signage to prevent unauthorized personnel from entering the area. In addition, INL security forces provide site security at the INL.

NOTE: *Signs are routinely lost because of high winds; however, these signs will be replaced as soon as possible the next working day following discovery.*

7.4 Wash Facilities and Designated Eating Areas

Ingestion of hazardous substances is possible when workers use poor personal hygiene. It is important to wash hands, the face, and other exposed skin thoroughly after work is finished and before smoking, eating, drinking, and chewing gum or tobacco. Smoking, chewing, eating, and drinking are not allowed inside the DWA or CWA. The designated wash facility or area with portable hand washing station will be determined before each project and will be discussed in the prejob briefing. Given the location of the task site, the CFA cafeteria (CFA-1612) will be the designated eating area and wash facility.

7.5 Designated Smoking Area

Smoking will only be permitted in designated smoking areas because of the high fire potential at the ordnance sites, and personnel will comply with all INL smoking policies, including disposing of smoking materials in the proper receptacle. The job site supervisor will be the single point of contact for establishing smoking areas. Smoking areas might not be permitted at certain times of the year because of high or extreme fire danger.

8. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

Project personnel will participate in the INL Occupational Medical Surveillance Program (or equivalent subcontractor program), as required by DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees," and 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response." Medical surveillance examinations will be provided (where required) before assignment, annually, and after termination of HAZWOPER duties or employment. Medical surveillance of the following personnel is required:

- Personnel who are, or might be, exposed to hazardous substances at or above the OSHA PEL, or published exposure limits, without regard to respirator use for 30 or more days per year
- Personnel who are injured, become ill, or develop signs or symptoms because of possible overexposure involving hazardous substances or agents during an emergency response or hazardous waste operation
- Personnel who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134, "Respiratory Protection"
- Personnel assigned to a hazardous material (HAZMAT) or emergency response team.

Personnel who wear a respirator while doing their job, or are required to take respirator training to do their duties under this plan, must participate in the medical evaluation program for respirator use at least annually, as required by MCP-2726, "Respiratory Protection."

A single copy of the project HASP, job hazard analysis requirements, required PPE, confined space entry requirements (as applicable), and other exposure-related information will be made available upon request to the INL OMP physician (and subcontractor physicians) conducting medical surveillance of personnel assigned to this project. Exposure monitoring results and hazard information furnished to the physician will be supplemented or updated annually as long as the worker is required to meet a hazardous waste and material employee medical surveillance requirement.

A documented medical clearance (e.g., a physician's written opinion) will be provided to the worker and line management stating whether the worker has any detected medical condition that would place him or her at increased risk of health impairment from working in hazardous waste operations, emergency response operations, respirator and other PPE-required-use areas, and confined space areas (as applicable). The physician can impose restrictions on the worker by limiting the amount and type of work performed or PPE that can be worn.

Personnel are responsible for communicating any work or medical restrictions to their supervisor so that work assignments can be modified if necessary. During the MCP-3003 prejob briefing, the supervisor conducting the briefing should ask workers if they have any work restrictions. However, the employee is responsible for informing the supervisor of any work or medical restrictions.

NOTE: *All managers, supervisors, and foremen have access to employees' current medical restrictions, certifications, and surveillances through the OMP database on the Safety and Health homepage or OMP reports link: http://webhome4/OMPReports/. This allows management to review medical restrictions, surveillances, and certifications before assigning work tasks to employees.*

8.1 Subcontractor Workers

Subcontractor project personnel will participate in a subcontractor medical surveillance program that satisfies the applicable requirements of 29 CFR 1910.120. Where medical surveillance is required, the program must make medical examinations available before assignment, annually, and after termination of hazardous waste duties, as stated previously. The physician's written opinion, as defined by 29 CFR 1910.120(f)(7) (or equivalent), will serve as documentation that subcontractor personnel are fit for duty, and the written opinion will list work restrictions.

Medical data from the subcontractor employee's private physician, collected pursuant to hazardous material worker qualification, will be made available to the INL OMP physicians upon request.

8.2 Injuries on the Site

It is the INL's policy that an INL OMP physician examine all injured personnel, including the following:

- A worker who is injured at the project site
- A worker experiencing signs and symptoms consistent with exposure to a hazardous material
- A worker believed to have been exposed to a hazardous substance, physical agent, or radiological hazard in excess of allowable limits during the course of a project at the INL.

NOTE: *In the event of an illness or injury, the decision to provide first aid and transport to the nearest medical facility or whether to immediately request an ambulance and continue to stabilize and provide first aid should be based on the nature of the injury or illness and the possibility that transporting the individual could cause further injury or harm. Most likely, the person making this decision will only be trained to the medic first aid/cardiopulmonary resuscitation (CPR) level and should contact the CFA medical facility at 777 or 526-1515 for further guidance if there is any question as to the extent of injury or potential for further harm by movement of the injured individual.*

In the event of a known or suspected injury or illness caused by exposure to a hazardous substance or physical agent, the worker will be transported to the nearest INL medical facility for evaluation and treatment, as necessary. The HSO and job site supervisor are responsible for obtaining as much of the following information as is available to accompany the worker to the medical facility:

- Worker name, job title, work (site) location, and supervisor's name and phone number
- Nature of the incident and injury or exposure and associated signs or symptoms of exposure
- Substance, physical or radiological agent exposed to (known or suspected), and material safety data sheet, if available
- First aid or other measures taken
- Exact location of the worker, including route to sites and potential hazards
- Locations, dates, and results of any relevant personal or area exposure monitoring or sampling
- List of PPE worn during this work (e.g., type of respirator and cartridge used).

Further medical evaluation will be determined by the treating or examining physician in accordance with the signs and symptoms observed, hazard involved, exposure level, and specific medical surveillance requirements established by the OMP director in accordance with the requirements of 29 CFR 1910.120.

NOTE: *In the event of an illness or injury, subcontractor employees will be taken to the closest INL medical facility (if doing so will not cause further injury or harm) or transported by INL ambulance to have an injury stabilized before transport to the subcontractor's treating physician or off-Site medical facility.*

The proper facility representative will be notified if any injury or illness occurs within a facility boundary. Most ordnance locations are outside facility boundaries and, thus, fall under the jurisdiction of the CFA site area director. If the ordnance removal site happens to fall under the jurisdiction of a facility other than CFA, the emergency contact for the facility will be announced during the prejob briefing or daily POD meeting. As soon as possible after an injured employee has been transported to the INL medical facility, the job site supervisor or designee will make additional project notifications as indicated in Section 10, "Emergency Response Plan."

8.3 Substance-Specific Medical Surveillance

No contaminants (listed in 29 CFR 1910, Subpart Z, "Toxic and Hazardous Substances") with substance-specific standards have been identified at the STF-02 Gun Range project site. If new contaminants of concern are identified during the course of project tasks, exposures will be evaluated and quantified to ascertain whether a substance-specific standard and associated medical surveillance requirements apply. If regulatory-mandated substance-specific standard action levels are triggered, then affected personnel will be enrolled in applicable substance-specific medical surveillance programs.

9. KEY SITE PERSONNEL RESPONSIBILITIES

This project's organizational structure reflects the resources and expertise required to perform the work while minimizing risks to worker health and safety, the environment, and the public. Key project positions, lines of responsibility, and communication are shown on the organization chart (Figure 9-1) and are limited to the field level. This organization chart is not all-inclusive but shows the structure for key resources assigned to complete project tasks. The "Project Execution Plan for the Balance of INEEL Cleanup Project" (PLN-694) provides details on the roles and responsibilities for Miscellaneous Sites Cleanup Project personnel above the project manager level. The following text outlines the responsibilities of key site personnel.

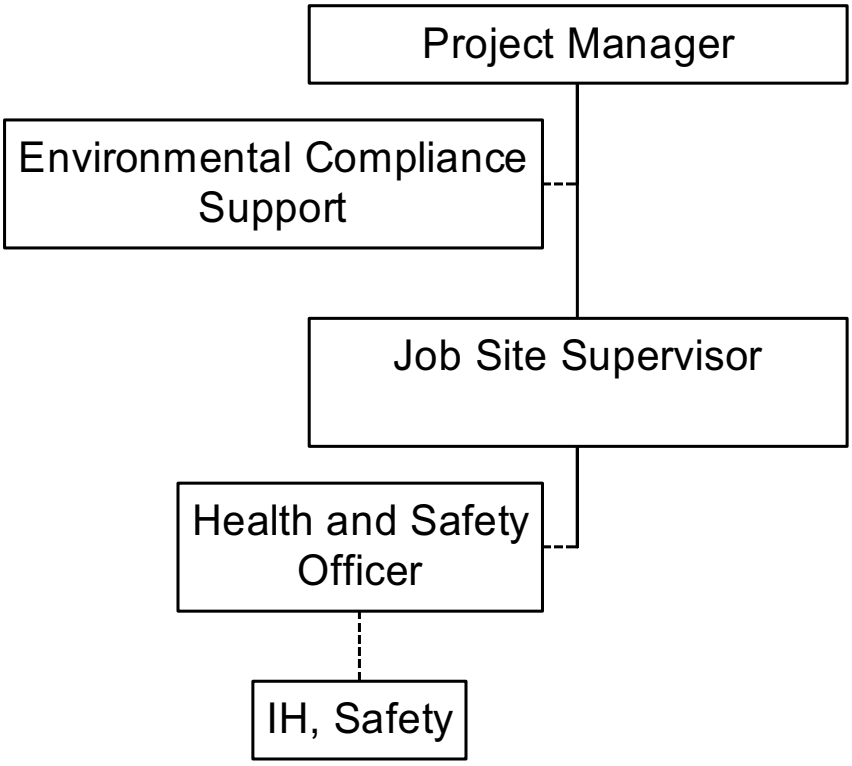


Figure 9-1. Organization chart.

9.1 Miscellaneous Sites Cleanup Project and Project Management

The following positions and associated roles and responsibilities are described in PLN-694:

- Miscellaneous Sites Cleanup Project manager of projects
- Miscellaneous Sites Cleanup Project safety, health, and quality assurance manager
- WAG manager
- Project engineer
- Environmental Compliance support
- Quality engineer.

9.1.1 Project Manager

The project manager is responsible for developing and managing the project and coordinating Miscellaneous Sites Cleanup Project operations. The project manager ensures that all project activities are conducted in accordance with INL and regulatory requirements and ensures that tasks comply with PLN-694 and this HASP. The project manager is responsible for the overall work scope, schedule, and budget for this project and reports to the WAG manager.

9.1.2 Environmental Compliance Support

Environmental Compliance support personnel oversee, monitor, and advise the project manager and job site supervisor performing site activities on environmental issues and concerns by ensuring compliance with DOE orders, U.S. Environmental Protection Agency regulations, and other regulations concerning the effects of site activities on the environment. The Miscellaneous Sites Cleanup Project's Environmental Compliance support personnel provide support surveillance for hazardous waste storage and transportation and for surface water/storm water run-off control.

9.2 Task Site Responsibilities

9.2.1 Job Site Supervisor

The job site supervisor is in charge of all fieldwork. The job site supervisor is the field supervisor for personnel assigned to work at the site. The job site supervisor works to accomplish day-to-day operations at the work site, identify and obtain additional resources needed at the site, and interact with the IH, safety engineer, and HSO on matters regarding safety and health. The job site supervisor must be informed about any health and safety issues that arise at the work site, and he or she can stop work at the site if an unsafe condition exists. The job site supervisor also shares the responsibility for daily prejob briefings.

The job site supervisor has the ultimate responsibility for task-specific procedural and safety decisions and compliance. The job site supervisor must be onsite during all field operations.

9.2.2 Health and Safety Officer

The assigned HSO is the primary contact for all health and safety issues. The HSO advises the job site supervisor on all aspects of health and safety and is authorized to stop work at the task site if any operation threatens worker or public health or safety. The HSO is authorized to verify compliance with the HASP, conduct inspections and self-assessments, require and monitor corrective actions, and monitor decontamination procedures (as appropriate). The CWI-assigned safety and health professional(s) at the task site (e.g., safety professional and IH) provides project oversight. Qualified subcontractor occupational safety and health representatives may perform onsite HSO duties when authorized through the procurement process by the subcontractor line of authority form (Form PROC 2121).

Persons assigned as the HSO or alternate HSO must be qualified (in accordance with the definition in 29 CFR 1910.120) to recognize and evaluate hazards and have the authority to take or direct actions to ensure that workers are protected. A subcontractor HSO must have completed an OSHA 30-hour course, possess the 8-hour HAZWOPER Supervisor Qualification, and typically have 2 years of safety and health-related experience in positions where occupational safety and health responsibilities comprised at least 50% of their time. Based on project size, complexity, and risk, the CWI safety engineer may change additional training/qualification requirements for the HSO in the project special conditions for subcontracts.

Other work-site responsibilities of the HSO must not interfere with the primary role of the HSO at the work site. If it is necessary for the HSO to leave the site, the HSO will appoint an alternate individual to fulfill this role, and that individual's identity will be communicated to project personnel and documented in the field team leader's logbook. Upon return, the HSO shall resume duties and it shall be noted in the field team leader's logbook. If no other personnel on the job site can meet the training and experience requirements for the alternate HSO, then work will cease until a qualified HSO is present.

9.2.3 Industrial Hygienist

The assigned IH is the primary source of information about exposure assessments for chemical, physical, and biological hazards at the task site. The IH assesses the potential for worker exposures to hazardous agents in accordance with INL safety and health manuals, MCPs, and industry-accepted industrial hygiene practices and protocol. By participating in project planning, the IH assesses and recommends appropriate hazard controls to protect site personnel, operates and maintains airborne sampling and monitoring equipment, reviews engineering controls for effectiveness, and recommends and assesses the use of PPE required in this HASP (recommending changes as appropriate).

9.2.4 Safety Professional

The assigned safety professional reviews work packages, observes site activity, assesses compliance with the INL safety and health manuals, advises the job site supervisor on required safety equipment, and recommends solutions to safety issues and concerns that arise at the task site. The safety professional may conduct periodic inspections in accordance with MCP-3449, "Safety and Health Inspections," and have other duties at the task site as specified in other sections of this HASP or in PRDs and MCPs. Copies of any safety and health inspections will be kept in the project field file.

9.2.5 Fire Protection Engineer

A fire protection engineer provides technical guidance to the HSO and job site supervisor regarding all fire protection issues. In addition, the fire protection engineer can be assigned to review the work packages and conduct preoperational and operational fire hazard assessments. The fire protection engineer is required to sign all safe work permits used as hot work permits within the jurisdiction of the facility site area director.

9.2.6 Specialty Subcontractors

Specialty subcontractors can be used to support task-site operations. A subcontractor lead can be appointed to serve as the single point of contact for all subcontractor communication at the site and report to the job site supervisor for all technical direction and interface issues at the project site. Subcontractor personnel will report any health and safety issues that arise to the job site supervisor or HSO and can stop work if an unsafe condition exists. The subcontractor lead also will be asked to provide hazard and mitigation information about the nature of the subcontractor's equipment or operations during the POD meeting, and he or she can participate in job-site hazard walk-downs.

9.2.7 Field Team Personnel

All field team personnel, including CFA operators and subcontractor support personnel assigned to the project, will understand and comply with the requirements of this HASP. As described in Section 6, the job site supervisor (or designee) will conduct a formal prejob briefing or POD at the start of each shift. Once at the project site, field team personnel are responsible for identifying any potentially unsafe situations or conditions to the job site supervisor or HSO for corrective action.

9.2.8 Nonfield Team Personnel

As defined by this HASP, all persons who are at a project site but not part of the field team (e.g., surveyors or others not assigned a field team support role) are considered nonfield team personnel.

Nonfield team personnel are considered occasional site workers in accordance with 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," and must receive site-specific HASP training before entering work areas at the project site, unless there is no potential for exposure and all safety hazards are mitigated (e.g., during downtime). In such a case, a site orientation briefing as described in Section 9.2.9, "Visitors," is required before nonfield team personnel are granted access to the area.

9.2.9 Visitors

All visitors with official business at the project site (including INL personnel and representatives of DOE and state or federal regulatory agencies) can only proceed into a designated or controlled work area after meeting the required training defined in Table 6-1.

If no potential exists for exposure to chemical or safety hazards (e.g., downtime), a visitor can be escorted at the project site after receiving a site orientation consisting of the following:

- An overview of the work areas at the site and access restrictions
- Inherent site hazards (e.g., terrain and equipment) and mitigating actions or avoidance
- Required PPE for entry to the site (must be trained to wear required PPE)
- Emergency action to take in case of a take-cover alarm, evacuation alarm, or other site emergency.

NOTE: *To minimize risks to workers and visitors, visitors might not be allowed into the controlled work areas during certain tasks. The job site supervisor in consultation with the HSO will make the final determination as to whether a visitor can enter a controlled work area.*

Where access is allowed, a fully trained task-site representative (e.g., job site supervisor or HSO) will escort visitors when entering controlled areas of the project site.

A casual visitor to the task site is a person who does not have a specific task to perform or other official business to conduct at the project site. **Casual visitors are not permitted in work areas at any project site.**

10. EMERGENCY RESPONSE PLAN

This emergency response plan defines the roles and responsibilities of project personnel during an emergency. Such an emergency could be at a WAG 10 project site, at a facility or collocated facility, or a Sitewide emergency. The intent of this section is to provide project-specific emergency response actions to meet 29 CFR 1910.120 requirements. Details of the INL Emergency Response Organization are available in "Emergency Management" (PLN-114). The overall process developed to respond to and mitigate consequences of emergencies that might arise at the INL is described in that plan.

"Emergency Management" (PLN-114) can be activated in response to events occurring at a project site, at the INL, or at the discretion of the emergency coordinator or emergency action manager. Once PLN-114 is activated, project personnel will follow the direction and guidance communicated by the emergency coordinator.

NOTE: *U.S. Department of Energy Orders 151.1B, "Comprehensive Emergency Management System," and 231.1A, "Environment, Safety, and Health Reporting," classify an emergency differently than the OSHA HAZWOPER standard definition. For this reason, the term "emergency event" will be used in this section when referring to a project HAZWOPER emergency.*

10.1 Planning for an Emergency

"Emergency Management" (PLN-114) provides the basis for planning actions to be taken in response to emergency events that could occur. That base plan is supplemented with INL facility-specific addenda. Such preplanning makes it possible for the INL to anticipate and appropriately respond to abnormal events that can affect the project. Preplanning also ensures that the Project Emergency Response Program is integrated with the INL contingency plans. Specific procedures for addressing emergency events and actions to be taken are further described in applicable facility-specific emergency procedures. The emergency response plan addresses project-specific planning requirements to meet project needs.

10.2 Emergency Preparation and Recognition

The HASP sections for hazard identification and mitigation (Section 2) and accident prevention (Section 4) provide the strategy that will be followed at project sites to prevent accidents. Similarly, emergency preparation and recognition will require Operations personnel to be constantly alert for hazardous situations and signs and symptoms of chemical exposure or releases. All project personnel should be familiar with the techniques for hazard recognition and the associated response, including proper operational notifications. Emergency phone numbers and evacuation route maps will be located throughout project operational areas.

Preparation and training on emergencies will include proper project access and egress procedures in response to project operational events and INL emergencies, as part of the HASP training and project operations area access training (where applicable). In addition, visitors will receive a briefing on emergency procedures and a general operations orientation (Table 6-1) and might have to complete HASP training, depending on the project operations area to be accessed. The visitor emergency actions briefing will include information regarding responses to various alarms, location and use of communication equipment, location of INL emergency equipment, and evacuation.

The requirements in MCP-2725, "Field Work," for training, emergency actions, and notifications will be followed for all projects conducted outside facility boundaries.

On-scene response to and mitigation of operational emergencies could require the expertise of INL Fire Department and medical personnel. Emergencies that could occur include the following:

- Accidents resulting in injury
- Fires
- Spills of hazardous or radiological materials
- Tornadoes, earthquakes, and other adverse natural phenomena
- Vehicle or transportation emergencies
- Safeguard and security emergencies
- Emergencies at nearby facilities that could prompt evacuation or take-cover actions at the task site.

10.3 Emergency Facilities and Equipment

Emergency response equipment maintained at the project site includes the items listed in Table 10-1. The INL Fire Department maintains an emergency hazardous material response van that can be used to respond to an event or emergency at the project. Fire Department personnel also are trained to respond immediately to hazardous material spills and medical emergencies. In addition, the CFA-1612 medical facility is manned by medical personnel to evaluate and stabilize injured personnel or those experiencing signs and symptoms of exposure.

Table 10-1. Emergency response equipment to be maintained at the project site during operations.

Equipment Name and Quantity Required	Location at Task Site	Responsible Person	Frequency of Inspection or Verification
First-aid kit	One in each project vehicle	HSO	Monthly (check seal only, unless broken)
Eyewash bottles[a] Eyewash station[a]	In or near DWA or CWA	HSO	Monthly
Hazardous materials spill kit	Project vehicle	HSO	Daily verification
Communication equipment	Onsite	Job site supervisor	Daily radio check (if radios are used)
Fire extinguishers, 10A/20BC	One and smaller ABC extinguisher in each project vehicle, as a minimum	HSO	Monthly

a. An eyewash bottle will be used to provide an immediate eye flush, if required. The HSO will inform personnel of the location of the eyewash station during the prejob briefing.

CWA = controlled work area
DWA = designated work area
HSO = health and safety officer

10.4 Emergency Communications and Notifications

In the event of an emergency, the capability is needed to summon INL emergency response resources, immediately notify site personnel, and inform others of site emergencies. Communications equipment at the task site might include a combination of radios, telephones (e.g., mobile, cellular, or facility), and pagers. Communication methods described below will be used during emergencies.

During emergencies, the Warning Communications Center (WCC) will be notified of any project emergency event. The WCC will then make the required Emergency Response Organization notification. The following information should be communicated, as available, to the WCC:

- The caller's name, title (e.g., job site supervisor or HSO), telephone number, and pager number
- Exact location of the emergency
- Nature of the emergency, including time of occurrence, current site conditions, and special hazards in the area
- Injuries (if any), including numbers of injured, types of injuries, and conditions of injured
- Emergency response resources required (e.g., fire, hazardous material, and ambulance).

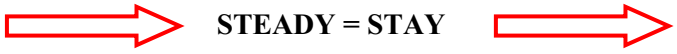
10.5 Emergency Alerting, Responses, and Sheltering

Alarms and signals are used at the project site and the INL to notify personnel of abnormal conditions that require a specific response. Responses to these alarms are addressed in general employee training. Emergency sirens located throughout the INL serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. A separate set of emergency signals has been established based on horn blasts (e.g., vehicle or air horn) to signal site personnel of a project-site emergency event.

Depending on the field location, facility alarms might not be audible at the project site. If the WAG 10 project site is outside the audible range of the facility alarms, then the notification to take cover or evacuate should be received on the field radio, mobile or cellular phone, or pager. The project-site emergency signals will be used to alert personnel to take emergency actions.

10.5.1 Take Cover—Continuous Siren

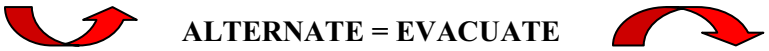
Radiation or hazardous material releases, adverse weather conditions, or other event or emergency conditions could require that all personnel take cover inside the nearest building. A TAKE COVER protective action can be initiated as part of a broader response to an emergency, and it might precede an evacuation order. The order to TAKE COVER is usually announced by activating the emergency siren. The signal to take cover is a CONTINUOUS SIREN.



However, the order to take cover also can be given by word of mouth, radio, or voice paging system. When ordered to TAKE COVER, project personnel will place the site and equipment in a safe configuration (as appropriate) and then seek shelter in a project vehicle. Eating, drinking, and smoking are not permitted during take-cover conditions.

10.5.2 Total Area Evacuation—Alternating Siren

A total area evacuation is the complete withdrawal of personnel from the project site and the entire facility area. The evacuation signal is an ALTERNATING SIREN. When ordered to EVACUATE, project personnel will place equipment and the site in a safe configuration (as appropriate) and then proceed along the specified evacuation route to the designated assembly area or as directed by the emergency coordinator.



For total area evacuations, facility command posts are activated, and all personnel will gather at the appropriate primary facility evacuation assembly area or, if outside a facility, the location designated by the emergency coordinator or job site supervisor. The job site supervisor or trained alternate will then complete the personnel accountability using the site attendance log. In this situation, the job site supervisor will report the results of the accountability process to the WCC or the facility emergency coordinator or area warden (if inside a facility).

10.5.3 Project Site Evacuation—Vehicle Horn Blast

A project site evacuation is the complete withdrawal of personnel from the project site, but it does not require the evacuation of the entire facility (if the site is located within a facility) or INL site area. A single, long horn blast (e.g., vehicle) will be the project's primary emergency evacuation signal (as listed in Table 10-2). However, the order to evacuate also can be given by word of mouth, radio, or voice paging system. When ordered to evacuate the project site, personnel will place the site and equipment in a safe condition and then proceed along the specified evacuation route to the designated project-site assembly area or as directed by the job site supervisor. Eating, drinking, and smoking are not permitted during emergency evacuations.

Table 10-2. Project internal emergency signals.

Device or Communication Method	Signal and Associated Response
Vehicle horn blasts	One long blast—Emergency evacuation. Evacuate project site immediately. Proceed in an upwind direction to the designated assembly area, as specified by the job site supervisor.
	Two short blasts—Nonemergency evacuation of immediate work area. Proceed to the designated assembly area, as specified by the job site supervisor.
	Three long blasts or verbally communicated—All clear, return to project site.

10.6 Personnel Roles, Lines of Authority, and Training

10.6.1 The Idaho National Laboratory Emergency Response Organization

The Emergency Response Organization structures are based on the Incident Command System and are described in "Emergency Management" (PLN-114) and facility-specific addenda to that plan.

10.6.2 Role of Project Personnel in Emergencies

Depending on the emergency event, a graded response and subsequent notifications will take place. Job site supervisor and project personnel responsibilities are described below. Personnel will respond to emergencies only within the limits of their training and as designated by their position. Emergency response actions also will be covered as part of the HASP briefing.

Currently, the STF-02 Gun Range is located outside any facility boundary, thus qualifying as fieldwork under MCP-2725, "Field Work." The CFA site area director has jurisdiction over this fieldwork. If additional sites identified for remediation are located within an INL facility's area of jurisdiction, the appropriate facility emergency contacts will be notified. Where these requirements apply, they will be addressed during the prejob briefing or POD.

10.6.2.1 Job Site Supervisor. The job site supervisor (or designated alternate) is responsible for initiating all requests for emergency services (e.g., fire and medical) and for notifying the WCC (as applicable) of abnormal (or potential emergency) events that occur during the project. The job site supervisor also can serve as the area warden (or designate that responsibility to another person who has been trained as area warden) and can conduct personnel accountability. In addition, the job site supervisor will control the scene until a higher-tiered Incident Command System authority arrives at the scene to take control. When relinquishing this role, the job site supervisor (or designated alternate) will provide all information about the nature of the event, potential hazards, and other information requested.

10.6.2.2 Project Personnel. Every person at the project site has a role to play during a project emergency event or INL emergency. Each worker must be constantly aware of potential dangers or unexpectedly hazardous situations and must immediately report these situations to the job site supervisor. All personnel are expected to watch out for their fellow workers, report their concerns to the job site supervisor, and take emergency actions as described in this section. Specific roles and responsibilities are further detailed in Table 10-3.

Table 10-3. Responsibilities during an emergency.

Responsible Person	Action Assigned
Job site supervisor (or designee)	Signal an evacuation.
	Report spill to WCC and appropriate spill notification personnel, and take actions to mitigate the situation.
	Contact the WCC.
Job site supervisor (or trained designee)	Serve as area warden, conduct accountability, and report to the WCC, shift supervisor, site area director, or emergency coordinator (as applicable).
HSO, medic, and first-aid trained personnel	Administer first aid to victims (voluntary basis only).

HSO = health and safety officer
WCC = Warning Communications Center

10.6.2.3 Personnel Accountability and Area Warden. Project personnel are required to evacuate the site in response to TAKE COVER, EVACUATION, and project site evacuation alarms. In all cases, the job site supervisor (or trained alternate) will serve as the area warden for the project and will complete the personnel accountability (following positive sweeps of the project site) based on the

attendance log. The results of this accountability will then be reported to the WCC, shift supervisor, site area director, or emergency coordinator (if the command post has been formed), as applicable.

10.6.2.4 Spills. If the material spilled is known and is small enough to be safely contained at the task site, then project personnel will control the spill using spill supplies at the site and will immediately report the event to the WCC. The WCC or the facility shift supervisor or equivalent (if inside a facility) will determine additional reporting requirements in accordance with MCP-190, "Event Investigation and Occurrence Reporting." If any release of a hazardous material occurs, project personnel will comply with the following immediate spill response actions.

10.6.2.4.1 Untrained Initial Responder—Perform the following if the initial responder is untrained, if the material characteristics are unknown, or additional PPE is required:

- Place equipment in a safe configuration
- Notify the job site supervisor
- **Evacuate** to upwind direction, and **isolate** the immediate area
- **Notify** the WCC or designated facility contact, and **warn** others in the area.

10.6.2.4.2 Trained Responder—Perform the following if material characteristics are known and no additional PPE is required:

- Place all equipment in a secure configuration
- Notify the job site supervisor
- **Stop** the spill if it can be done without risk (e.g., returning the container to the upright position, closing the valve, and shutting off the power)
- **Secure** any release paths if safe to do so
- **Notify** the WCC or designated facility contact, and **warn** others in the area.

10.7 Medical Emergencies and Decontamination

Medical emergencies and responses to injuries or suspected exposures will be handled as stated in Section 8.2, "Injuries on the Site." Decontamination of personnel and equipment is described in Section 11.2, "Equipment and Personnel Decontamination."

10.8 Evacuation Assembly Areas and Central Facilities Area Medical Facility

Since project remediation activities and detonations will be conducted outside of a facility, the INL evacuation routes listed in PLN-114 will be used. Evacuation assembly areas will be discussed during the prejob briefing. Figure 10-1 shows the location of the CFA medical facility (CFA-1612).

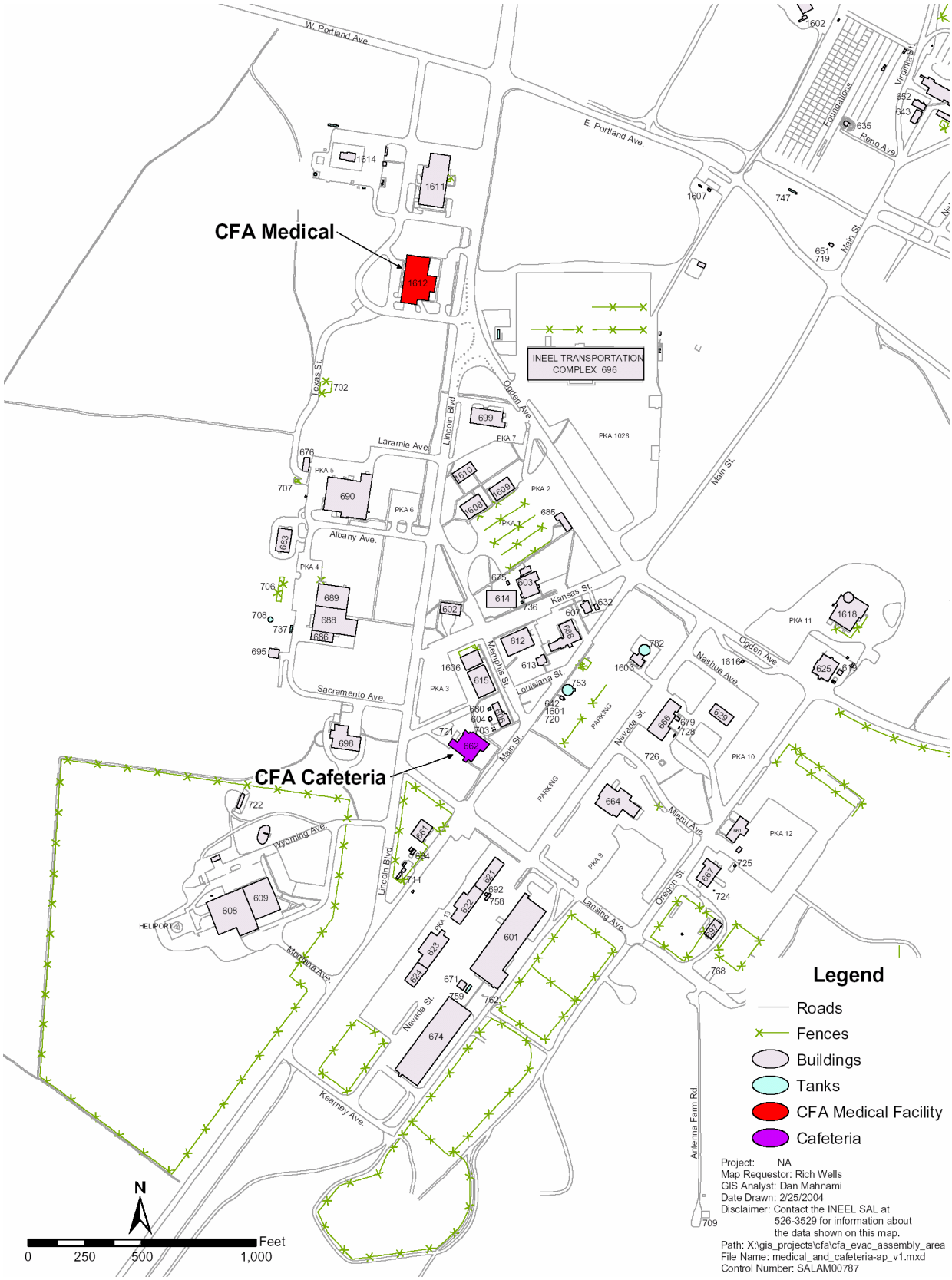


Figure 10-1. Map showing the location of the Central Facilities Area medical facility (CFA-1612).

10.9 Reentry, Recovery, and Site Control

All reentry and recovery activities will follow general site security and control requirements identified in Section 7, "Site Control and Security," unless conducted as part of an emergency response action or if initiated based on task site hazards. The on-scene commander with technical support from the job site supervisor will control all entries to the project site in support of emergency actions.

10.9.1 Reentry

During an emergency response, it is sometimes necessary to reenter the scene of the event. Reasons for reentry include the following:

- Perform personnel search and rescues
- Respond to medical first-aid needs
- Perform safe shutdown actions
- Perform mitigating actions
- Evaluate and prepare damage reports
- Perform radiation or hazardous material surveys.

Reentries will be carefully planned to ensure that personnel are protected from harm and to prevent initiating another emergency event. Reentry planning is undertaken as a graded approach, depending on the nature of the initiating event and as directed by the on-scene commander.

10.9.2 Recovery

After the initial emergency actions have been taken and effective site controls have been established, response efforts will shift toward recovery. Recovery is the process of assessing post-event and post-emergency conditions and developing a plan for returning to pre-event and pre-emergency conditions, when possible, and following the plan to completion. The on-scene commander is responsible for determining when an emergency is sufficiently stable to terminate the emergency and enter the recovery phase. The project manager, with concurrence from the site area director, will appoint the recovery manager.

10.10 Critique of Response and Follow Up

A review and critique will be conducted following all project emergency events, drills, and exercises at the INL. In some cases, an investigation might be required before commencing recovery actions. For this reason, care should be exercised to preserve evidence.

10.11 Telephone and Radio Contact Reference List

Table 10-4 lists the project's general points of contact. Because personnel listed might change frequently, working copies of this list will be generated to note new positions and changes of assigned personnel. This HASP should not be revised with a Document Action Request (DAR) (Form 412.11) to note these changes.

Table 10-4. Project emergency contact list.

Contact Title	Contact Name	Phone Number or Radio Net	Cellular Phone Number	Pager Number
WCC, fire, medical emergency, and security	—	777 526-1515	—	—
CFA site area director	Steven L. Winn	6-1075	520-6013	5494
Miscellaneous Sites Cleanup Project area manager	J. L. Butler	6-9124	351-9260	4123
WAG 10 project manager	Michael P. Hodel	6-9684	520-6563	6698
Operable Unit 10-04 lead	Richard P. Wells	6-2920	—	7712
Job site supervisor	Joseph A. Landis	6-6311	521-2323	6792
Health and safety officer	To be determined	—	—	—
Safety professional	Claude E. Pettengill	6-3975	569-4519	—
WAG 10 safety and health point of contact	Lawrence E. McManamon	6-3658	521-8405	—
Industrial hygienist	John K. Welker	6-6446	521-0361	5752
Quality assurance lead	John W. Farren	6-1084	521-3586	—
WAG 10 environmental compliance	Scott L. Reno	6-5778	520-0271	—

CFA = Central Facilities Area
WAG = waste area group
WCC = Warning Communications Center

11. DECONTAMINATION PROCEDURES

Radiological and chemical contamination is not expected during the course of the STF-02 Gun Range remediation addressed by this HASP. However, if contamination is encountered at levels requiring decontamination, this section provides guidance on how the decontamination will be performed.

11.1 Contamination Control and Prevention

Contamination-control and -prevention procedures will be implemented to minimize personnel contact with surfaces contaminated by lead when such surfaces are or might be encountered during project tasks. Where these surfaces are encountered, engineering controls, protective barriers, protective clothing, and modified work control practices will be used or hold points and surveys will be added to minimize direct contact with contaminated surfaces.

11.2 Equipment and Personnel Decontamination

Personnel and equipment decontamination procedures are necessary to control contamination and protect personnel where soil is contaminated with lead. Lead-contaminated soil on equipment or protective clothing will be physically removed and decontaminated from surfaces before the equipment and clothing can leave the site, based on a graded approach. If significant amounts of such soil must be removed from heavy equipment, then the HSO and project IH will evaluate the decontamination measures, on a case-by-case basis, to determine the most appropriate level of PPE to be worn.

11.2.1 Equipment Decontamination

A decontamination pad can be established if large-scale decontamination of equipment is required before it is released from the project site. Physical removal of soil debris (e.g., scraping) will be the primary decontamination method. If additional equipment decontamination is deemed necessary (e.g., wet wiping with an amended water solution), then the project IH will determine the appropriate PPE to be worn for this task.

11.2.2 Personnel Decontamination

Unless upgrading is warranted, project activities will be conducted in Level D PPE. Engineering controls in conjunction with work controls and proper handling of lead-contaminated soil and samples will be the primary means of eliminating the need for personnel decontamination.

When personal decontamination is required, removal of the outer layer of protective clothing (e.g., gloves, coveralls, or booties) will be the primary decontamination method. The assigned project IH will determine additional personal decontamination techniques of lead-contaminated soil on a case-by-case basis.

11.2.3 Decontamination in Medical Emergencies

Medical care for serious injury or illness will not be delayed for decontamination. In such cases, gross decontamination can be conducted by removing the injured person's outer protective clothing (if possible), and other contaminated areas can be contained with a bag or glove. If contaminated PPE cannot be removed without causing further injury (except for the respirator, which must be removed), the individual will be wrapped in plastic, blankets, or other available material to help prevent contaminating the inside of the ambulance, medical equipment, and medical personnel.

Injured workers will then be evaluated immediately by first-aid-trained project personnel (on a voluntary basis) at the project task site. The injured worker will be stabilized within the limits of training of the first-aid-trained individual, and the job site supervisor will contact the WCC to summon emergency services (i.e., INL Fire Department and CFA medical services) to the project site.

The IH will accompany the employee to the medical facility to provide information and decontamination assistance to medical personnel. Contaminated PPE then will be removed at the CFA medical facility and will be handled carefully to prevent the spread of contamination.

11.3 Doffing Personal Protective Equipment and Performing Decontamination

As stated earlier, no personnel decontamination beyond doffing of PPE is anticipated for this project. Careful removal of the outer PPE will be the primary decontamination method.

The specific doffing sequence of modified Level D and C PPE, and associated decontamination procedures, will be based on the nature of contamination. A general approach for doffing modified Level D and C PPE is described below. However, no single doffing strategy works for all circumstances. Modifications to this approach are appropriate at the discretion of the project HSO in consultation with the project IH or if site conditions change.

11.3.1 Modified Level D Personal Protective Equipment Doffing and Decontamination (if required)

Where required to be worn, modified Level D protective clothing (e.g., Tyvek coveralls and booties) will be doffed after standard radiological removal techniques (rolling outside surface inward and down), and removal will constitute the initial decontamination step. Tape, gloves, and booties will be removed following the posted doffing sequence if the protective clothing is also being worn as an anticontamination layer. All PPE will be placed in the appropriately labeled waste container(s) for disposal. Doffing and any required decontamination will take place at the designated site work area.

11.3.2 Level C Personal Protective Equipment Doffing and Decontamination

Where respiratory protection is worn in conjunction with protective clothing (Level C PPE), the modified Level D sequence will be followed with one additional step. After protective clothing doffing, respirators will be removed and placed in a separate container. Doffing and any required decontamination will take place at the designated work area.

11.4 Site Sanitation and Waste Minimization

Unless a field portable unit is set up, site personnel will use the toilet facilities at CFA or another INL area facility. Potable water and soap or disposable sanitizing towelettes will be made available in these areas for personnel to wash their hands and face upon exiting the work area.

Waste materials will not be allowed to accumulate at routine monitoring sites. Appropriately labeled containers for industrial waste and CERCLA waste (as required) will be maintained at the project site. Personnel should make every attempt to minimize waste through the judicious use of consumable materials. All site personnel are expected to make good housekeeping a priority at the job site.

12. RECORDKEEPING REQUIREMENTS

12.1 Industrial Hygiene Records

When Industrial Hygiene support is required, the IH will record airborne monitoring and sampling data (both area and personal) collected for exposure assessments in the INL Hazards Assessment and Sampling System database. All monitoring and sampling equipment will be maintained and calibrated in accordance with INL procedures and the manufacturer's specifications. Industrial hygiene airborne monitoring and sampling exposure-assessment data are treated as limited-access information and are maintained by the IH in accordance with procedures in the INL safety and health manual.

Project personnel or their representatives have a right to receive the monitoring and sampling data (both area and personal) from the IH. When they become available, results from monitoring data also will be communicated to all field personnel during daily POD meetings and formal prejob briefings in accordance with MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback."

12.2 Field Logbook and Site Attendance Record

Logbooks will be maintained in accordance with MCP-1194, "Logbook Practices for ER and D&D&D Projects." The job site supervisor will record the field logbook daily site events and will record in a site attendance logbook the names of everyone who is onsite each day. The site attendance logbook can be the same as the field logbook, depending on the project. Personnel will only be required to sign in and out of the attendance record once each day. The job site supervisor is responsible for maintaining the site attendance record and for ensuring that all personnel on the project site sign in (if required). Logbooks must be submitted to Administrative Records and Document Control (ARDC) within 30 days of completing field activities.

12.3 Administrative Record and Document Control Office

The ARDC will organize and maintain data and reports generated by Miscellaneous Sites Cleanup Project field activities. The ARDC maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Copies of the management plans for the Miscellaneous Sites Cleanup Project, this HASP, PLN-694, the QAPjP, and other documents pertaining to this work are maintained in the project file.

13. REFERENCES

29 CFR 1910, 2005, "Occupational Safety and Health Standards," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

29 CFR 1910, Subpart Z, 2005, "Toxic and Hazardous Substances," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

29 CFR 1910.120, 2005, "Hazardous Waste Operations and Emergency Response," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

29 CFR 1910.132, 2005, "General Requirements," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

29 CFR 1910.134, 2005, "Respiratory Protection," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

29 CFR 1910.1000, 2005, "Air Contaminants," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

29 CFR 1926, Subpart P, 2005, "Excavations," *Code of Federal Regulations*, Office of the Federal Register, March 2005.

49 CFR 171.8, 2005, "Definitions and Abbreviations," *Code of Federal Regulations*, Office of the Federal Register, June 2005.

42 USC § 6901 et seq., 1976, "Resource Conservation and Recovery Act (Solid Waste Disposal Act)," *United States Code*, October 21, 1976.

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code,* December 11, 1980.

ACGIH, 2003, *Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®)*, American Conference of Governmental Industrial Hygienists.

ANSI S1.25, 1991, "American National Standard Specification for Personal Noise Dosimeters," American National Standards Institute, January 1, 1991.

ANSI Z41, 1999, "User Guide and Protective Footwear Standard Combination Set," American National Standards Institute, January 1, 1999.

ANSI Z87.1, 2003, "Practice for Occupational and Educational Eye and Face Protection," American National Standards Institute, June 19, 2003.

ANSI Z89.1, 2003, "Personal Protection—Protective Headwear for Industrial Workers," American National Standards Institute, July 23, 2003.

DOE O 151.1B, 2003, "Comprehensive Emergency Management System," U.S. Department of Energy, October 29, 2003.

DOE O 231.1A, 2004, "Environment, Safety, and Health Reporting," U.S. Department of Energy, Change 1, June 3, 2004.

DOE O 440.1A, 1998, "Worker Protection Management for DOE Federal and Contractor Employees," U.S. Department of Energy, March 27, 1998.

DOE-ID, 2001, *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04*, DOE/ID-10807, Rev. 0, U.S. Department of Energy Idaho Operations Office, August 2001.

DOE-ID, 2002, *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites*, DOE/ID-10980, Rev. 0, U.S. Department of Energy, U.S. Environmental Protection Agency, Idaho Department of Environmental Quality, November 2002.

DOE-STD-1090-2004, DOE Standard, "Hoisting and Rigging," U.S. Department of Energy, June 2004.

Form 361.24, 2000, "Tailgate Attendance Roster," Rev. 2, Idaho National Engineering and Environmental Laboratory, February 2000.

Form 361.25, 1999, "Group Read and Sign Training Roster," Rev. 1, Idaho National Engineering and Environmental Laboratory, May 1999.

Form 361.47, 2001, "Hazardous Waste Operations (HazWoper) Supervised Field Experience Verification," Rev. 5, Idaho National Engineering and Environmental Laboratory, July 2001.

Form 412.11, 2004, "Document Management Control Systems (DMCS) Document Action Request (DAR)," Rev. 11, Idaho National Engineering and Environmental Laboratory, June 2004.

Form 433.01, 2002, "Outage Request," Rev. 4, Idaho National Engineering and Environmental Laboratory, October 2002.

Form 540.10, 2004, "Subcontractor Requirements Manual (SRM) Applicability," Rev. 15, Idaho National Engineering and Environmental Laboratory, December 2004.

GDE-6212, 2005, "Hazard Mitigation Guide for Integrated Work Control Process," Rev. 5, *Manual 6–Maintenance*, Idaho National Engineering and Environmental Laboratory, March 2005.

INEEL, 2001, "INEEL Training Directorate," Idaho National Engineering and Environmental Laboratory, URL: http://train1.inel.gov/index.html.

MCP-8, 2003, "Performing Management Assessments and Management Reviews," Rev. 7, *Manual 13B–Quality and Requirements Management Procedures*, Idaho National Engineering and Environmental Laboratory, September 2003.

MCP-153, 2002, "Industrial Hygiene Exposure Assessment," Rev. 6, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, October 2002.

MCP-190, 2004, "Event Investigation and Occurrence Reporting," Rev. 11, *Manual 9–Operations*, Idaho National Engineering and Environmental Laboratory, August 2004.

MCP-432, 2004, "Radiological Personal Protective Equipment," Rev. 9, *Manual 15B–Radiation Protection Procedures*, Idaho National Engineering and Environmental Laboratory, May 2004.

MCP-553, 2003, "Stop Work Authority," Rev. 7, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, April 2003.

MCP-1194, 2003, "Logbook Practices for ER and D&D&D Projects," Rev. 1, *Balance of INEEL Cleanup CERCLA/DD&D Work Processes*, Idaho National Engineering and Environmental Laboratory, May 2003.

MCP-2692, 2004, "Ergonomics Program," Rev. 4, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, April 2004.

MCP-2704, 2005, "Heat and Cold Stress," Rev. 4, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, February 2005.

MCP-2719, 2004, "Controlling and Monitoring Exposure to Noise," Rev. 3, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, March 2004.

MCP-2725, 2004, "Field Work," Rev. 4, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, December 2004.

MCP-2726, 2003, "Respiratory Protection," Rev. 9, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, December 2003.

MCP-2745, 2005, "Heavy Industrial Vehicles," Rev. 2, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho Completion Project, March 2005.

MCP-2749, 2002, "Confined Spaces," Rev. 5, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, November 2002.

MCP-2750, 2004, "Preventing Disease from Rodents, Birds, and Bats," Rev. 4, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, Idaho National Engineering and Environmental Laboratory, November 2004.

MCP-3003, 2005, "Performing Pre-Job Briefings and Documenting Feedback," Rev. 13, *Manual 9–Operations,* Idaho Completion Project, March 2005.

MCP-3449, 2005, "Safety and Health Inspections," Rev. 5, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection*, Idaho National Engineering and Environmental Laboratory, January 2005.

MCP-3562, 2004, "Hazard Identification, Analysis, and Control of Operational Activities," Rev. 9, *Manual 9–Operations*, Idaho National Engineering and Environmental Laboratory, December 2004.

PDD-1004, 2004, "Integrated Safety Management System," Rev. 7, *Manual 1–General Administration and Information,* Idaho National Engineering and Environmental Laboratory, April 2004.

PLN-114, 2005, "Emergency Management," Rev. 24, *Manual 16A–Emergency Preparedness Base Plan*, Idaho National Laboratory, June 2005.

PLN-694, 2004, "Project Execution Plan for the Balance of INEEL Cleanup Project," Rev. 6, Idaho Completion Project, December 2004.

PRD-22, 2004, "Excavation and Surface Penetration," Rev. 5, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, August 2004.

PRD-25, 2003, "Activity Level Hazard Identification, Analysis, and Control," Rev. 3, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, June 2003.

PRD-324, 2004, "Material Handling and Storage," Rev. 0, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, August 2004.

PRD-600, 2003, "Maintenance Management Requirements," Rev. 3, *Manual 6–Maintenance*, Idaho National Engineering and Environmental Laboratory, March 2003.

PRD-5099, 2002, "Electrical Safety," Rev. 3, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, September 2002.

PRD-5103, 2001, "Walking and Working Surfaces," Rev. 0, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, March 2001.

PRD-5117, 2005, "Accident Prevention Signs, Tags, Barriers, and Color Codes," Rev. 1, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho Completion Project, March 2005.

PRD-5119, 2004, "The Program Requirements for the Voluntary Protection Star Process at the INEEL," Rev. 4, *Manual 14A–Safety and Health-Occupational Safety and Fire Protection*, Idaho National Engineering and Environmental Laboratory, January 2004.

PRD-5121, 2004, "Personal Protective Equipment," Rev. 5, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, April 2004.

PRD-5123, 2002, "Motor Vehicle Safety," Rev. 0, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* Idaho National Engineering and Environmental Laboratory, August 2002.

Project and Construction Management Department, 2005, *Subcontractor Requirements Manual*, TOC-59, Rev. 43, Idaho Completion Project, April 2005.

Safety and Fire Protection Department, 2005a, *Manual 14A–Safety and Health–Occupational Safety and Fire Protection,* TOC-48, Rev. 158, Idaho Completion Project, May 2005.

Safety and Fire Protection Department, 2005b, *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, TOC-49, Rev. 88, Idaho Completion Project, March 2005.

STD-101, 2004, "Integrated Work Control Process," Rev. 16, *Manual 6–Maintenance*, Idaho National Engineering and Environmental Laboratory, August 2004.